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liography on Radioactivity in the Atmosphere (Supplement), p. 324

9 March 1958 No. 3

METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 9 MARCH 1958 No. 3

SPECIAL FEATURE IN THIS ISSUE

Bibliography on Radioactivity in the Atmosphere (Supplement)

By
Geza Thuronyi

(*For complete table of contents see back cover*)

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FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to bring to the attention of meteorologists current literature in their field and in related fields and to provide bibliographic information on various subjects, as interest demands.

Part I contains abstracts of current literature in the fields of meteorology, oceanography, etc., arranged according to the Universal Decimal Classification.

Part II of each issue comprises an annotated bibliography of important references on a special subject (usually arranged chronologically). No attempt is made to prepare exhaustive bibliographies; instead, the aim is to include a representative cross section of the various aspects of a subject.

Bibliographies published in the successive issues were:

Vol. I, 1950

1. Atmos. Pollution 2. Aerobiology 3. Cloud Physics 4. Hail
5. Tornadoes 6. Volcanic Dust 7. Climat. Changes 8. Thunderstorms
9. Icing 10. Acoust. Propagation 11. Evaporation

Vol. II, 1951

1. Extended Forecast. 2. Long Range Forecast. 3. Soil Temp. 4. Constants, etc.
5. Clim. of Near East 6. Clim. of Middle East 7. Special Winds 8. Radar Storm Detect.
9. Condensation Trails 10. Clim. of N.E. Africa 11. Mountain Met.

Vol. III, 1952

1. Clim. of N.W. Africa 2. Carbon Dioxide 3. Clim. of Argentina, etc. 4. Dew
5. Objective Forecast. 6. Stratus Forecast. 7. Urban Climatology 8. Clim. of C. Africa
9. Visibility 10. Glaze and Rime 11. Free Air Turbulence

Vol. IV, 1953

1. Turbulence Theory 2. Turbulent Diffusion 3. Frost 4. Clim. of Australia, etc.
5. High Level Winds 6. Winds in Stratosphere 7. Jet Stream 8. Radiation Bioclim.
9. Clim. of Pacific 10. Auroras 11. Sferics

Vol. V, 1954

1. Oceanog. Met. 2. Clim. of S.E. Asia 3. Auroral Physics 4. Tropopause
5. Balloons 6. Numerical Forecast. 7. Radiation Data 8. Vertical Motion
9. Clim. of Arctic 10. Industrial Met. 11. Wind Waves and Swell

Vol. VI, 1955

1. Bibliog. of Bibliog. 2. Texts & Monogr. Bibliogs. 3. Storm Surges
4. Ionospheric Prop. 5. Photochem.—Upper Atmos. 6. Cloud Physics
7. Radar Cloud Physics 8–9. Atmos. Nuclei 10. Weather Modification 11. Cooling Power

Vol. VII, 1956

1. Synoptic Met.-Arctic 2. Clim. of Enclosed Spaces 3. Cosmic Rays (–1952)
4. Cosmic Rays (1953–56) 5. Atmos. Radioactivity 6. Inversions
7. Snow Micromet. 8. Snow Micromet. (Suppl.) 9–11. Tropical Cyclones

Vol. VIII, 1957

1. Solar Weather Relations 2. Night Airglow 3. Forecasting Special Elements
4. Forest Micrometeorology 5. Hydromet. Forecasting 6. Numerical Forecasting (Suppl.)
7. Albedo 8. Meteors 9–10. Tropospheric Propagation 11. Medical Meteorology

Vol. IX, 1958

1. Radioastronomy 2. Solar Astrophysics 3. Radioactivity in Atmosphere

Other bibliographies in preparation are:

Actinometers *Long Range Forecasting* *Singularities*
Geomagnetism *Ozone* *Synoptic Aerology*
High Atmosphere Temperatures *Physical Oceanography* *Waves and Currents*

Part III contains a listing of reviews, translations, reprints, and the contents of important publications. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. The December issue comprises cumulative author, subject, geographical and journal indexes.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where the material may be found. The Union List of Serials (Gregory) is the source of most of the symbols used. In some cases, where no symbol has been assigned to a library, one will be devised according to the principles of the Union List.

Library symbols used frequently may be found in the following list:

DA:	U. S. Dept. of Agriculture Library, Washington, D. C.
DBS:	U. S. Bureau of Standards Library, Washington, D. C.
DGS:	U. S. Geological Survey Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DN-HO:	U. S. Navy Hydrographic Office Library, Suitland, Md.
DNLM:	U. S. National Library of Medicine, Washington, D. C.
DSI:	Smithsonian Institution Library, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.
GB-MO:	Great Britain, Meteorological Office Library, Harrow, England.
MH-BH:	Harvard University, Blue Hill Observatory Library, Milton, Mass.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicates a good bibliography.
§	before an entry indicates a synoptic case history study accompanied by charts.

Geographic locations are in the English form rather than the form used locally, for example Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherwise stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to the Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months are abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Number (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus an entry will read as follows:

Meteorologische Rundschau, 2(5/6):146–151, May/June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, *Jahrgang* 2 (Vol. 2), *Heft* 5/6 (No. 5/6), *pages* 146–151, May/June 1950.

PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

MAJOR GENERAL WORKS

COLLECTED WORKS

9.3–1 551.584:551.551:551.506.5

*†Lettau, Heinz H. and Davidson, Ben (*eds.*), **Exploring the atmosphere's first mile. Proceedings of the Great Plains Turbulence Field Program, Aug. 1–Sept. 8, 1953, O'Neill, Nebraska.** Pub. by the Pergamon Press, N. Y., on behalf of the Geophysics Research Directorate, Air Force Cambridge Research Center, Air Research and Development Command, **1957.** 2 vol. (578 p.) Vol. 1, p. 1–376, **Instrumentation and data evaluation.** Vol. 2, p. 377–578, **Site description and data tabulation.** Numerous tables, figs. (incl. photos), refs., eqs. Price: $20.00. Contents of Vol. 1: P. 1–6, **History and general objectives of the program, Summary of the instrumentation and data collection phases, and General conclusions.** P. 7–16, **Synoptic material.** P. 17–80, **Subsoil measurements.** P. 81–125, **Interface measurements.** P. 126–198, **Mast profile data (meaned quantities).** P. 199–275, **Free air observations.** P. 303–372, **Appendix.** For listing of contents *see* Pt. III, March **1958,** *MAB.*—The proceedings of the comprehensive Great Plains Turbulence Field Program (Aug. 1–Sept. 8, 1953) at O'Neill, Nebraska, which was under the general direction of the Geophysics Research Directorate of AFCRC, with assistance of or participation by 10 universities and 4 government agencies, are presented in these two volumes. The history and objectives of the micrometeorological and aerological program, the site, instrumentation, etc. is followed by 65 separate scientific papers on every instrumental and observational aspect of the program. Some of the papers are only 1 or 2 pages long—others are major articles 35–40 pages in length. The variety of observations can be seen in the table of contents, ranging from ozone concentration profiles (p. 188–198), ping pong ball anemometers (p. 140–144), refractive index fluctuations (p. 220–227), etc. to radiosonde (p. 293–295, and 298), soil density, temperature, conductivity and moisture measurements (p. 17–80) and radiation measurements (p. 81–98) of various types; and dew (p. 123–125), drag (p. 104–117) and smoke puff drift (p. 117–119). Vol. II contains a description of the site, climatology of the region and of the year 1953, scheduling of observations, annotation on the method of data presentation, and the data grouped in 7 general observational periods of 25 hours each. *Subject Headings:* **1. Great Plains Turbulence Field Program 2. O'Neill, Nebraska. I. Great Plains Turbulence Field Program, Aug. 1–Sept. 8, 1953, O'Neill, Nebraska.**—*M.R.*

9.3–2 551.525.4:551.525.5:62

*National Research Council, Wash., D. C. Highway Research Board, **Factors influencing ground freezing, presented at the 35th Annual Meeting, Jan. 17–20, 1956.** pub. Wash., D. C., **1956.** 165 p. figs., tables, bibliogs., eqs. Contents: Turner, K. A., Jr. and Jumikis, A. R., **Loss of bearing capacity and vertical displacements of New Jersey soils,** p. 24–76. Turner, K. A., Jr. and Jumikis, Alfreds R., **Subsurface temperatures and moisture contents in six New Jersey soils, 1954–55,** p. 77–108. Jumikis, Alfreds R.: **Cold quantities in New Jersey, 1901–1955,** p. 119–123. Aldrich, Harl P., Jr., **Frost penetration below highway and airfield pavements,** p. 124–149. Jumikis, Alfreds R., **The soil freezing experiment,** p. 150–165. **DWB** (M25.5 N277fi)—These reports contain a great deal of engineering data on soil temperatures, freezing, moisture characteristics, etc., obtained in New Jersey and correlated with air temp., degree day and other environmental data (shown graphically or in tables). Instruments used, methods of observation, theoretical-empirical formulas, short period freezing during cold waves and long period records are described or analyzed. The article by JUMIKIS analyzes temp. (degree day) data for 3 stations, Layton, New Brunswick and Indian Mills

in N. Central and S. New Jersey for 1901–55 to give an index of the severity of the winters. *Subject Headings*: 1 **Soil freezing** 2 **Soil temperatures** 3 **Engineering meteorology** —*M.R.*

9.3–3 551.586:63:631.4(058)

U. S. Dept. of Agriculture, **Soil, the yearbook of agriculture for 1957.** Washington, D. C., U. S. Govt. Print. Office, **1957.** 754 p. figs., tables, refs. **DLC, DWB**—Articles of interest: Russell, M. B., **Physical properties (of soil),** p. 31–38. Richards, L. A. and Richards, S. J., **Soil moisture,** p. 49–60. Taylor, Sterling A., **Use of moisture by plants,** p. 61–66. Allaway, W. H., **pH, soil acidity, and plant growth,** p. 67–71. Blakely, B. D.; Coyle, J. J. and Steele, J. G., **Erosion on cultivated land,** p. 290–307. Chepil, W. S., **Erosion of soil by wind,** p. 308–320. Stoesz, A. D. and Brown, Robert L., **Stabilizing sand dunes,** p. 321–326 Evans, Chester E. and Lemon, Edgar R., **Conserving soil moisture,** p. 340–358. Criddle, Wayne D. and Haise, Howard R., **Irrigation in arid regions,** p. 359–367. Quackenbush, T. H. and Thorne, M. D., **Irrigation in the East,** p. 368–378. Edminster, T. W. and Reeve, Ronald C., **Drainage problems and methods,** p. 378–385. George, Ernest J.; Read, Ralph A.; Johnson, E. W. and Ferber, A. E., **Shelterbelts and windbreaks,** p. 715–721—The present volume consists of entirely new material which brings up to data the excellent collection of articles in the 1938 yearbook "Soils and Men." (The earlier volume was devoted to soil classification, land use and other technical material.) The emphasis in the current edition is on soil management (soil moisture conservation, irrigation in arid regions and supplementary irrigation, drainage problems, stabilizing dunes, wind erosion, water erosion, shelter belts, wind breaks, field crops, forest soil management, pastures and a series of articles on soil management by regions (16) of the U. S.). The volume contains a map of the U. S. showing the location of all of the agricultural research facilities of various types, and a list thereof. The articles are not as technical as were those in the 1938 yearbook but contain substantial information for the practical farmer. *Subject Headings:* 1. **Soil conservation** 2. **Yearbook of Agriculture.**—*M.R.*

TEXTBOOKS

See also: **Properties of trains of waves in ocean and lab.** (Miche), 9.3–76.

9.3–4 551.594(02)

†Israël, Hans, **Atmosphärische Elektrizität, Teil 1, Grundlagen, Leitfähigkeit, Ionen.** [Atmospheric electricity, Vol. 1, Fundamentals, conductivity, ions.] Leipzig, Akademische Verlagsgesellschaft Geest & Portig, **1957.** 370 p. 124 figs., 25+16 tables, bibliog., p. 327–366, 317 eqs. **DLC** (QC961.I79)—This volume XXIX of the famous monograph series, **Probleme der Kosmischen Physik,** maintains the high standards of previous texts in this series, and is the most comprehensive of several analogous works by the author. About 15 pages are devoted to historical aspects (since W. Wall in 1708 and Franklin in 1750). Then about 50 chapters in 3 other sections are devoted to ions, their origin, movement, absorption, diffusion, charges, radioactive ionisation, atmospheric electricity phenomena and variability, conductivity and effect of nuclei, weather, time and space variations, large ions, small ions and the ion balance maintained by artificial radioactivity effects. The appendix covers instruments and measurement techniques, useful tables and a bibliography of 841 items up to 1955. The section on measurement techniques (p. 240–313) is taken from the author's contribution to Band III of the new edition (1957) of Linke's **Meteorologisches Taschenbuch** (Israël, Hans and Dolezalek, Hans, **Luftelektrizität, Messmethoden und Geräte** [Atmospheric electricity, measurement methods and instruments.] In: **Linkes Meteorologisches Taschenbuch.** Leipzig, **1957** 3:62–177. 34 figs., tables, bibliog. p. 165–177, 79 eqs.) Illustrative material, theory and practical nomograms and tables are present in proper balance with the textual material. [The second volume, to be issued soon, will cover the various aspects of atmospheric electrical fields, charges and currents, including the regional or climatological and synoptic aspects.] *Subject Heading*: 1 **Atmospheric electricity textbooks** —*M.R.*

9.3–5 551.510.42(02)

†Meetham, A. R., **Atmospheric pollution: its origins and prevention.** 2d rev. ed. London, Pergamon Press, **1956.** 302 p. 82 figs., 28 tables, bibliog. at end of each ch. General

bibliog. p. 291–297. **DWB**—(For abstract on 1952 edition, *see* 4.2–12, Feb. **1953,** *MAB.*) The first edition of this concise text on all aspects of atmospheric pollution and its control has been revised and an extra chapter added to cover research done in 1952–5 on the recent fog disasters (e.g., the London fog of 1952), on the physics and chemistry of smogs, on precautions taken in Great Britain and on the peculiar problem of Los Angeles smog. A bibliography of recent (and earlier substantial) works is added, besides the short reference lists at the end of each chapter. The 15 chapters contained in the first edition include one on measurement (X), on distribution of pollution, especially in Britain (XI), on changes (daily, weekly, yearly and with weather changes (XII), on effects (XIII), etc. *Subject Headings:* **1. Atmospheric pollution textbooks 2. Great Britain.**—*M.R.*

9.3–6 551.583.3(02)

Ebers, Edith, **Vom grossen Eiszeitalter.** [On the great Ice Age.] Berlin, Springer-Verlag, **1957.** 138 p. 77 figs., 14 refs. (*Verständliche Wissenschaft,* Vol. 66.) **DLC** (QE697.E22)—A small, well-illustrated book on various aspects of the great ice ages, including the climatic effects on glaciation and the glacial effects on climate. The several chapters are concerned with: 1) Present and past glaciation, 2) glacial action and remnants, 3) glacial landscape morphology, 4) climatic events in glacial periods, 5) evidence of successive glaciations, 6) extent of, and extended influence of glaciation, 7) glaciated areas of Europe, America, etc., 8) glacial history of the Mediterranean and the Baltic, 9) plant and animal remains of the ice ages, 10) human remains and development during ice ages, 11) varves and strata, loess and pollen chronology of glacial period, 12) origin of ice ages. Periglacial phenomena, timber line, snow line, frozen ground, radiocarbon dating, solar influences, etc. are discussed in their appropriate sections of the several chapters. Temperature, rainfall, wind, cloudiness and solar radiation are the factors considered most relevant to glacial or interglacial incidence. *Subject Headings:* **1. Glacial periods 2. Climatic changes 3. Textbooks on glacial periods.** —*M.R.*

9.3–7 551.511:551.513:551.515

Gandin, L. S.; Laĭkhtman, D. L.; Matveev, L. T. and Iudin, M. I., **Osnovy dinamicheskoĭ meteorologii.** [Principles of dynamic meteorology.] Leningrad, Gidromet.-Izdat., **1955.** 546 p. 144 figs., 42 tables, numerous eqs. Review by T. Kopcewicz in *Przegląd Geofizyczny,* Warsaw, 2(3):185–186, **1957. DLC** (QC861.L26)—A very substantial textbook on theoretical and applied aspects of dynamic meteorology. The seventeen chapters are divided among 5 major headings: I. General principles of atmospheric dynamics: 1) basic equations, 2) analysis and approximations in practical use; II. Thermodynamics of the atmosphere, radiant energy: 3) first law of thermodynamics and application to dry air processes, 4) second law of thermodynamics and its application, 5) thermodynamics processes in moist air and thermal convection in atmosphere, 6) radiant energy—short and long wave and balance; III. Dynamics and statics of the free atmosphere: 7) statics, 8) wind in free air, 9) nonperiodic pressure changes, 10) dynamically induced pressure changes, 11) discontinuity surfaces and waves in atmosphere; IV. Boundary layers in atmosphere: 12) meteorological structure of surface layer of air, 13) structure of atmosphere in boundary layer; V. Energetics of atmosphere circulation: 14) vorticity, energy changes, 15) local circulations, 16) temperature regime at sea level in troposphere and stratosphere, zonal and meridional, diurnal and seasonal, 17) annual circulation in temperate and tropical zones, long waves, planetary frontal zones aloft, meridional transport of heat, etc. A good subject index makes the textbook a practical guide for solution of scores of problems of advanced or practical "theory." The treatment is quite up-to-date, embracing recent developments in the fields of turbulence and diffusion, tropopause analysis, numerical prediction, albedo variations over the globe, orographic effects. The book is not only replete with mathematical equations of a high order, but contains many cross-sections and mean, synoptic charts and schematic diagrams. *Subject Headings:* **1. Dynamic meteorology 2. Meteorology textbooks.**—*M.R.*

MONOGRAPHS

See also: **Oceanog. data, N.E. Pacific** (Love), 9.3–70; **N. Atlantic Coast wave statistics** (U. S. Beach Erosion Board), 9.3–71; **High altitude vision** (Whiteside), 9.3–98; **Forest climates** (Rubner, Reinhold), 9.3–114; **Air pollution, Conn.** (McCaldin), 9.3–126; **Ionospheric electron density** (Baker, *comp.*), 9.3–283.

9.3–8 551.585

†*Kaĭgorodov, A. I., **Estestvennaia zonal'naia klassifikatsiia klimatov zemnogo shara** [Natural zonal classification of the climates of the earth.] Moscow, Akademiia Nauk SSSR, **1955.** 119 p. port., 5 figs., 9 tables+tables in appendix, 49 refs. At head of t-p: Akademiia Nauk SSSR, Institut Geografii [and] Institut Sotsialisticheskogo Sel'skogo Khoziaĭstva. **DWB** (M8 K13e)—This monograph published posthumously presents the principles of the climatic classifications developed and used by A. I. KAĬGORODOV to construct climatic maps of the earth. The contents of this volume are as follows: the principle definitions of the concept of climate; the physical, geographical bases of climate, including the atmospheric processes and the underlying earth's surface; analysis and definition of the concept of climate; climate and weather; the fundamental principles of constructing a natural zonal classification of climates, principles of selecting classification isotherms and division of the earth's surface into zones and subzones; selection of classifications isotherms and the system designating the characteristic temperature regime; final selections of isotherms and designations of zones, subzones and types of climate on the maps; and characteristics of regions as determined by the moisture. The climatic classification is analogous to the Köppen system. A supplement contains the climate characteristics of the principal meteorological stratum in the classifications of A. I. KAĬGORODOV. *Subject Heading:* **1. Climatic classification.**—*I.L.D.*

9.3–9 551.515.11(71)

Hage, Keith D. (*Weather Forecasting Research Center*), **On summer cyclogenesis in Western Canada associated with upper cold lows.** Chicago. Univ. Dept. of Meteorology, Contract AF 19(604)-2179, Scientific Report No. 1, June **1957.** 87 p. 27 figs., 12 tables, 39 refs., 13 eqs.—Data for Western Canada for 8 summers (1947–55) including 102 cases, are classified according to 4 general types of synoptic development and the monthly frequency of each type determined; tracks of upper cold lows are also classified according to 4 types, associated development of pressure centers analyzed, average movements of systems determined, intense and weak developments compared, and a number of selected case histories presented and analyzed. Sea level development is found to be associated with passage of areas of positive vorticity advection over the east slope of the Rockies. Also it is found that the movement of an upper cold low is influenced by the next trough up stream. A formula is presented for computing this movement, and nomograms and rules presented for use in practical forecasting of development or deepening. *Subject Headings:* **1. Summer cyclogenesis, W. Canada 2. Cyclogenesis 3. Western Canada.**—*M.R.*

9.3–10 551.524.7:551.515.7(431.55)

†§*Grasnick, Carl Heinz, **Die Temperaturänderung der Troposphäre über Lindenberg im Bereich von Antizyklonen durch Strahlungs- und Turbulenzvorgänge.** [Temperature change of the troposphere over Lindenberg due to radiative and turbulent processes in anticyclonic regions.] *Germany. Deutsche Demokratische Republik. Meteorologischer und Hydrologischer Dienst, Abhandlungen*, No. 43, **1957.** 102 p. 61 + 10 figs., 25 tables, 38 refs., 77 eqs. **DWB**—The accuracy (or rather inaccuracies) of measurements of total water vapor in a column of air, and of radiation measurements dependent on accurate water vapor estimates and on pressure, etc., are first discussed for the layer of atmosphere below the 500 mb. level. Two anticyclonic synoptic situations (1–7 June, 1950 and 5–13 Sept. 1951) are studied thoroughly on the basis of surface and 500 mb charts and soundings. Radiative temp. changes for Berlin (Lindenberg) are computed for each situation, using elaborate nomograms which are presented and their use described in appendix. Finally, the theory and practical aspects of height and time factors in radiative temp. changes in the lower layers of the atmosphere are discussed from the point of view of previous works of this type and of the present method which combines

adiative and turbulent mixing processes in the technique. *Subject Headings:* **1. Tropospheric emperature changes in anticyclones 2. Radiative temperature 3. Turbulent temperature hanges in anticyclones 4. Lindenberg, Germany.**—*M.R.*

9.3–11 551.587

*Ratner, Benjamin (*Office of Climatology, U. S. W. B., Wash., D. C.*), **Upper-air climatology of the United States, Pt. 1, Averages for isobaric surfaces, height, temperature, humidity, and lensity.** *U. S. Weather Bureau, Technical Paper*, No. 32, June **1957.** 199 p. 94 charts, numerous tables. **DWB**—This publication is the first of a series presenting climatological statistics of the upper air. Average values of height, temperature, relative humidity, and lensity at constant pressure surfaces for a network of stations in the United States, Alaska, and the Caribbean are presented. A series of analyzed charts and cross sections further depict these data. The data are based upon radiosonde observations at 0300 GMT during the 10-year period 1946–1956. The units used and the method of summarizations are discussed. *Subject Headings:* **1. Upper air climatology 2. United States.**—*Author's abstract.*

9.3–12 551.510.41:546.214

†Paetzold, H. K. and Regener, E., **Ozon in der Erdatmosphäre.** [Ozone in the earth's atmosphere.] *Handbuch der Physik*, Berlin, 48:370–426, **1957.** 47 figs., numerous foot refs., bibliog. p. 424–426 (46 refs.), 10 tables, 25 eqs. **DWB** (551.03 N236)—A long review of the history and present status of ozone research from its discovery in 1785 (by Van Marum) to the latest work of the authors in 1957. The six main chapters cover: 1) general and historical; 2) the absorption spectrum of O_3; 3) methods of measurement (a. optical, b. chemical); 4) photochemical theory; 5) vertical variation; 6) variations of total ozone; 7) the ozone layer and structure of the stratosphere. Every conceivable aspect is considered and supported by tables and charts. Examples are given of records, geographical and synoptic relationships, seasonal, diurnal and height variations, etc. *Subject Headings:* **1. Ozone 2. Ozone bibliographies 3. Ozone data 4. Ozone records.**—*M.R.*

9.3–13 551.577(781)

*Colby, Charles C.; Dillingham, H. Lloyd; Erikson, E. Gordon et al., **The Kansas Basin: Pilot study of watershed.** A University of Kansas study undertaken with grant assistance from Resources for the Future, Inc. Univ. of Kansas Press, Sept. **1956.** 103 p. 96 figs., 99 tables, refs. at end of each chapter, 2 charts (colored) folded in pocket at end. On t-p: **Introduction to the Kansas Basin Project. DWB** (333.91 K16k)—Ch. 3 (p. 31–41) of this comprehensive water-land use study of the Kansas River Basin (of Kansas and Nebraska) gives an analysis of the precipitation variability in the area based on records from 1886–1955 (Salina, Kan.) and shorter periods at Lawrence and Colby, Kan. Special attention is paid to wet and dry periods at different seasons, and to departures from normal during separate months of each year from 1926–55. Folded chart gives a map of Kansas for each separate year (1920–55) showing ranges of precipitation in different categories. Ch. 4 discusses water, runoff and floods. *Subject Headings:* **1. Precipitation in Kansas 2. Dry spells in Kansas 3. Kansas River Basin. I. Kansas. Univ. II. Jenks, George F. III. Jones, J. O. IV. Sinclair, Robert.**—*M.R.*

9.3–14 551.577.37:551.579.4(79)

*U. S. Corps of Engineers, **Ten-year storm precipitation in California and Oregon coastal basins.** Project CW-151 (Civil Works Investigations), Flood Volume Studies, West Coast, Technical Bulletin, No. 4, May **1957.** 7 p. numerous charts (many fold.), 8 eqs. **DWB** (M79.4/79 U582f)—A nice compilation of statistics on the annual precip. for 2 years, 10 years, and 50 years (1906–56) compared with 3-day storm precip. which exceeds the 10-year for Oregon and California. Data for 250 stations were used in the study. Annual values were for July–June, and seasonal (winter) values for Oct.–June. Frequency values were compiled for selected stations, 50-year normals used to interpolate, and adjustments were made to the 50-year period from nearby stations where records were from 20–50 years. For each set of values, a series of long folded charts are included—each for a strip 1° of lat. and 5° long.

across Oregon or California from the Pacific Ocean to eastern Oregon or Nevada. Graphs show the relation between theoretical and observed frequencies of departures from normal or annual maximum 3-day precip. for 41 stations (1488 station years); and coefficients of intercorrelation between stations various distances apart (0–120 mi) for both annual precip. and annual maximum 3-day precip. The relation between the normal annual precip. and the maximum 3-day precip. is shown in detail in a series of charts. The ratios range from 52% in S. Central Calif. to 9% in N.W. Oregon. The annual precip. increases irregularly but systematically from S. to N. whereas the annual maximum 3-day precip. increases irregularly, but definitely from N. to S. as one goes from the Columbia River to the Mexican border. Greatest annual averages are >160″ in N.W. Oregon. Greatest 3-day maximum exceeded once in 10 years is >20″ in S. Central Calif. (east of L.A.). Ratio of 10 year to 2 year maximum precipitation is also charted—they range from 1.36 to 2.64 (N.W. Ore. and S. Central Calif.). Actual values of all these parameters and station locations are given in tables. *Subject Headings:* **1. Storm precipitation on West Coast 2. Precipitation variability 3. Maximum 3-day precipitation 4. California 5. Oregon. I. Project CW-151.**—*M.R.*

9.3–15 551.506.5:551.584(58)

*Laĭkhtman, D. L. and Aĭzenshtat, B. A. (*eds.*), **Materialy Ekspeditsii v Golodnuiu Step'.** [Data from the expedition to Golodnaya Steppe.] *Akademiia Nauk Uzbekskoĭ SSR, Tashkent. Institut Matematiki i Mekhaniki, Trudy*, No. 19, pub. Tashkent, **1957.** 194 p. almost entirely tables. **DLC**—This monograph contains the data on the meteorological regime prevailing in the atmospheric layer near the ground which were obtained by the interdisciplinary expeditions to southern Kazakhstan (Pakhta-Aral' oasis) of the Central Geophysical Observatory. The data were collected in 1952 on an irrigated cotton field and on semi-desert area. Observations were made at fixed intervals eleven times per day and ten series of round-the-clock observations were carried out. The introduction contains the names of the individual scientists participating in this study, a description of the methods of observations including data on the general weather associated with the series of observations, the method of actinometer observations, method of temperature and humidity observations to a height of 3 m and of wind velocity at a height of 16 m, method of soil temperature observations and the method of aerological observations. The tables which constitute the body of the book, contain the following data: gradient observations on wind, actinometer observations (including radiation balance, total radiation, diffuse radiation, albedo, etc.), gradient observations on air temperature and humidity, soil temperature and magnitude of evaporation with total of individual constituents of heat balance, soil moisture at various depths (0 to 100 cm), percent of hours in which soil under cotton was shaded, the balloon data on atmospheric temperature, pressure, relative humidity, wind direction, velocity and gustiness at different elevations, atmospheric pressure, temperature and relative humidity obtained by airplane flights, radiosonde data and pibal observations. *Subject Headings:* **1. Micrometeorological data 2. Golodnaya Steppe, Kazakhstan. I. Leningrad. Glavnaia Geofizicheskaia Observatoriia II. Akademiia Nauk Uzbekskoĭ SSR, Tashkent.**—*I.L.D.*

9.3–16 551.501.81:551.515.3:551.579

Ligda, Myron G. H.; Bigler, Stuart G.; Tarble, Richard D. and Truppi, Lawrence E., **Use of radar in severe storm detection, hydrology, and climatology.** Texas. Agricultural and Mechanical College. Dept. of Oceanography and Meteorology, Contract Cwb-8716, Final Report, Oct. **1956.** each section repaged. Contents: Pt. 1, Bigler, Stuart G. and Lidga, Myron G. H.: **Radar severe storm detection.** 23 p. 16 figs., 16 refs. **Pt. 2,** Tarble, Richard D. and Ligda, Myron G. H., **Radar hydrology.** 26 p. 21 figs., 2 tables, 6 refs. **Pt. 3,** Truppi, Lawrence E. and Ligda, Myron G. H., **A survey of radar climatology.** 18 p. 8 figs., 8 refs. **DWB**—Research begun in 1955 with the purpose of improving observation or identification of severe storms, forecasting of storms and floods, and climatological studies based on the use of radar equipment is reported in some detail. The first phase of the research dealt mainly with tornado identification and tracking. Almost 200 tornado observations were obtained in 1955. Hooked echoes characterized tornado situations in many instances. Pt. II of the report deals with radar hydrology and flood forecasting. Several causes of inaccuracies in

this method of storm rainfall determination are treated, as well as the recommended methods of analysis and actual case histories. Part III goes into the pioneer studies on radar climatology, which though not immediately applicable, must be carried on for years if ever to be used. Examples of isohyetal maps of east Texas are given. *Subject Headings:* **1. Radar tornado detection 2. Radar hydrology 3. Radar climatology 4. Texas.**—*M.R.*

9.3–17 551.582.1(85)

Drewes, Wolfram U. and Drewes, Arlene T., **Climate and related phenomena of the eastern Andean slopes of Central Peru.** Syracuse. Univ. Research Institute, Contract DA 19-129-QM-466, (Unnumbered Report), June **1957.** 85 p. 24 figs., 10 tables, photos, 18 refs. **DWB** (M82.1/85 D776c)—This study aims to determine the existence of significant climatic relationships between the tropical lowlands and the highland Alpine area on the eastern slopes of the Central Peruvian Andes. Climatic data were obtained from field stations over a two month period of observation (Jan.–Feb. 1956) as well as from permanent stations with long term records, all located between an elevation of 500 and 13,000 ft above sea level. The climatic data are related to relief, soil color, and vegetation. The monograph contains a description of the region, the vegetation, geology, soil, the general climatic characteristics and the weather station sites. This is followed by data on temperature inversions, diurnal temperature variation, temperature relationships within the first five feet above the ground, microclimatic studies, winds, rainfall, relative humidity, etc. The data are presented in tables and in graphs. The appendices contain graphed data on the temperature and rainfall regions at permanent weather stations. *Subject Headings:* **1. Climate of East Central Peruvian Andes 2. East Central Peruvian Andes.**—*I.L.D.*

9.3–18 551.575(26):551.509 325

*Nurminen, Aili, **Variations in the difference between the dew point of the air and the water temperature before sea fog.** *Finland. Ilmatieteellinen Keskuslaitos, Toimituksia,* No. 42, **1957.** 20 p. 5 tables, 7 refs. **DWB** (MO55 F511t)—Data for 3 stations on the south coast of Finland for April–June 1946–57, and for 6 other stations for shorter periods, are analyzed and discussed in connection with incidence of sea fog and the critical difference between dew point of the air and the surface temperature of the sea ($T_d - T_w$) before, during and after fog. The 3 commonest causes of sea fogs of long duration are: 1) warm moist advection, 2) discontinuity lines in wind field, 3) frontal zones between warm occlusion and cold fronts. Sea fog forms only when $T_d - T_w$ is small. Measurement of sea fog inland is studied on basis of data from Helsinki and Malmi airports. Examples of fogs and data for each example are presented and discussed. *Subject Headings:* **1. Sea fog formation 2. Sea fog forecasting 3. Finnish Coast.**—*M.R.*

9.3–19 551.582.2(52) 551.524

*Japan. Meteorological Agency, **Climatic records of Japan and the Far East area: mean daily maximum temperature, mean daily minimum temperature.** Tokyo, June **1957.** 231 p. almost entirely tables. "This volume is a continuation of its **Climatic Records of Japan and the Far East area: air pressure, air temperature and amount of precipitation,** pub. June **1954.**" —Monthly and annual mean daily maximum and mean daily minimum temps. are tabulated for 400 stations in Japan, Kuriles, S. Sakhalin, Korea, Pacific Islands, Manchuria, etc. from beginning of record through 1952. Some of the records are for only 1 or 2 years—others for 70 years or more. (*See also* 6.10–241, Oct. 1955, *MAB.*) *Subject Headings:* **1. Climatic data for Japan 2. Mean maximum and minimum temperature data 3. Japan.**—*M.R.*

9.3–20 551.577(794) 551.579

*California. Dept. of Water Resources, **Report on Upper Feather River service area. [Interim report of the Northeastern Counties Investigation.]** April **1955.** 293 p. photos, 16 plates (fold. in color), 63 tables. **DWB** (627.1 C153re)—In this large volume on the water resources of the Feather River Basin in East North Central Calif., Ch. II on Water Supply contains much data on precipitation, runoff, underground hydrology, quality of water, etc. The data used include the 50 year period from 1897–8 through 1946–7. More detailed studies involved the 32 years from 1920–21 through 1951–2. Data for 36 precipitation stations

with 10 years or more of unbroken record are presented and analyzed. These stations are poorly distributed—53% of the basin is >5,000 ft but only 5 stations (5000–5080 ft) lie above that elevation. The only records above that elevation are from 20 snow courses in or adjacent to the Basin—all but one above 5000 ft, and one above 8000 ft. Data for these snow courses are also tabulated. Seasonal and year to year variations in precipitation are revealed in tables. An isohyetal chart shows detailed precipitation patterns (50 year averages) for the Basin with isohyets for every 5 in. (10–95″ per year). Runoff and river gage, present and future water use data and other hydrologic data are presented in great detail, with many charts, plates and tables. *Subject Headings:* **1. Precipitation data for Feather River Basin, Calif. 2. Water resources surveys 3. Feather River Basin, Calif.**—*M.R.*

9.3–21 551.509.324.1:551.576.1

†Stone, Robert G., **A compendium on cirrus and cirrus forecasting.** *U. S. Air Weather Service, Technical Report*, No. 105–130, March **1957.** 156 p. 59 figs., tables, 82 refs. **DWB**—A comprehensive review of available information on cirriform clouds ("High clouds") with particular reference to operational forecasting and climatological points of view. "This report indicates the effects of cirrus on military operations, and rates the requirements for forecasting cirrus. Details are reviewed as to observing problems, forms of cirrus, physical conditions of cirrus, their modes of formation, thickness, distribution with height, season, area, and relation to various other meteorological conditions. Visibility values, optical and electrical phenomena, icing and turbulence in cirrus are discussed. The various methods proposed for forecasting high clouds are represented from original sources, and opinions as to their probable practical values are expressed. Considerable data of a climatological sort are included, including heretofore unpublished tabulations based on Project Cloud-Trail." *Subject Heading:* **1. Cirrus forecasting.**—*From author's foreword.*

TRANSLATIONS

9.3–22 551.506.5(98)

***Materialy nabliudenii nauchno-issledovatel'skoĭ dreĭfuiushcheĭ stantsii 1950/51 goda.** [Observational data of the scientific-research drifting station of 1950/1951.] Ed. by Mikhail M. Somov. Leningrad, Morskoĭ Transport, **1955.** 3 vol. Trans. into English by David Kraus of Vol. 3, Pt. 8, Chukanin, K. I.: [**Meteorological observations**], p. 7–36, and Appendices, p. 37–217. Issued by American Meteorological Society, under Contract AF 19(604)-1936, 1956? Trans. includes 25 p. of translated text, plus reproduction of the original illustrative material (figs., photos and tables), with original Russian legends. Trans. available from ASTIA, No. AD 117139.—The extensive standard meteorological observational data obtained 4 times daily during the period April 2, 1950 to April 9, 1951 at lat. 76°10′N, 193°E to 81°32′N, 197°18′E, are tabulated and accompanied by explanations of observational methods and illustrations of layout of station, activities, equipment, etc. Ceiling or cloud height data from pilot balloon observations, detailed snow depth and density measurements, instrument calibration work, a log of weather events and some extracted climatic data are included in introductory section. Results are compared with those of the "Fram," "Sedov" and "Severnyi Polius" expeditions. Highest temperature was +4.4°C on July 21, lowest −49.3° on Jan. 14. *Subject Headings:* **1. Soviet drifting station 1950–51 2. Observational data in Arctic 3. Arctic Basin. I. Kraus, David** (*trans.*) **II. Somov, Mikhail M.** (*ed.*).—*M.R.*

9.3–23 551.584.32:631.41 551.582.1(910)

***†Mohr, Edward C. J., **The soils of equatorial regions with special reference to the Netherlands East Indies.** Trans. from the Nederlandsch by Robert L. Pendelton. Ann Arbor, J. W. Edwards, **1944.** 766 p. 257 figs., 138 tables, numerous foot-refs. **DWB** (631.43 M699s). This is a translation of his **De bodem der tropen in het algemeen, en die van Nederlandsch-Indie in het bijzonder,** issued in 2 vol. (6 parts), from **1933–1938,** as *Koninklijk Instituut voor de Tropen, Amsterdam, Mededeeling*, No. 31 [Colonial Institute of Amsterdam, Publication]. 816 p. 236 plates.—A wealth of physical and especially climatic or meteorological data and information about the various parts of the Netherlands Indies, and about the soils and soil formation-weathering-erosion processes in general is contained in this large

illustrated volume. Ch. 2 (p. 41–70) deals with soil climate (soil temperature, water, rainfall, evaporation, classification of climates, etc.), Ch. 3 (p. 71–95) with weathering processes, Ch. 4 (p. 96–142) with organic material and erosion. In each section on soils of various islands or regions (p. 193–694) there is a section on climate, rainfall, etc. of the area, accompanied by detailed data and interpretation in terms of soil processes. *Subject Headings:* **1. Soil climates of Indonesia 2. Climate of Indonesia 3. Indonesia. I. Pendleton, Robert L.** (*trans.*).—*M.R.*

NEW SERIALS

9.3–24 550.3(058)

Mexico (City). Universidad Nacional, **Instituto de Geofísica Anales,** Vol. 1, pub. **1955.** . . . Vol. 2, **1956.** paging varies. figs., tables, refs., eqs. **DLC** (QC801.M4)—The Geophysical Institute was founded in March 1945 but did not exist in reality until Feb. 1949 when funds first became available and a director (Ricardo Monges López) was appointed. The 10 departments include: 1. Seismology; 2. Gravimetry; 3. Geomagnetism; 4. Oceanography; 5. Cosmic Rays; 6. Geodesy; 7. Meteorology; 8. Hydrology; 9. Volcanology and 10. Applied Geophysics. Studies are classified under 4 areas: 1. physics of earth's crust, 2. of earth's core, 3. of the seas and 4. of the atmosphere. Each is discussed separately and the physics of the atmosphere discussed under 3 branches: meteorology, geomagnetism, and cosmic ray. Various types of geophysical networks in Mexico are portrayed on folded maps. Personnel in the several fields are listed and a few papers on cosmic rays, geomagnetism, seismology, geodesy, etc., presented in full. One paper dealing with a subject of interest to meteorologists (aerosols) by Gall and LaMer has been abstracted separately. (*See* 8.9–243, Aug. 1957, *MAB.*) All articles are in Spanish. Vol. 1 contains 13 scientific papers complete with theory and diagrams (line drawings) but no photographic illustrations. (Papers of interest in these two volumes will be run in Contents, Pt. III, p. 230, Feb. 1958. Also, several papers in vol. 2 were abstracted separately.) *Subject Headings:* **1. Serial publications 2. Geophysics annuals.**—*M.R.*

9.3–25 551.5(26)(05)

The Ship and Maritime Meteorology, Tokyo, Vol. 1, No. 1, March 1957. Latest issue seen Vol. 1, No. 2, June **1957.** Quarterly? about 30 p. each. Issued by Japan. Meteorological Agency. In Japanese. Title page and table of contents in English. **DWB**—A new Japanese journal devoted to short articles of interest to mariners—reports of meetings of the WMO Maritime Meteorological Commission, reports of severe storms, rules for evading typhoons, radar precipitation detection, marine weather codes, broadcasts, lists of selected ships and ships reporting by log, notes and news, etc.; a few illustrations and photos on slick paper are included in each issue. Articles are classified by the U.D.C. system. Synoptic charts accompany some of the articles. (For listing of contents of 1(1) and 1(2), *see* Pt. III, p. 1564, Nov. **1957,** *MAB.*) *Subject Headings:* **1. Marine meteorology periodicals 2. Serial publications 3. Japanese language periodicals. I. Japan. Meteorological Agency.**—*M.R.*

GENERAL GEOPHYSICS AND METEOROLOGY

GENERAL GEOPHYSICS

See: **Instituto de Geofísica Anales,** 9.3–24; **Polar geophysics** (Dué Rojo), 9.3–39.

IGY, WMO

See also: **Results of first U.S.S.R. Antarctic Sea Expedition** (Kort), 9.3–46; **Satellite!** (Bergaust), 9.3–79.

9.3–26 551.501.9:551.509:550.3:061.3

World Meteorological Organization, **International Geophysical Year, 1957/1958, Meteorological programme: Lists of stations.** Its *OMM/WMO,* No. 58, AGI/IGY. 2, **1957.** 108 p. T-p and text in French and English. **DWB**—This monograph contains a list of 95 countries

participating in the IGY meteorological program, of station of various categories, arranged by hemispheres, regions (continents) and index numbers. The several categories are: 1) surface synoptic, 2) upper air synoptic, 3) radiation, 4) ozone and 6) sferics stations. Lists Nos. 5) atmospheric electricity, 7) nuclear radiation and 8) atmospheric chemistry stations were not ready for publication at this time. Types of instruments and observations are given, in some instances, in addition to the coordinates of the stations. *Subject Headings:* **1. IGY meteorological networks 2. Sferics networks for IGY 3. Ozone networks for IGY.** —*M.R.*

9.3–27 550.3:061.3

Greenberg, Milton and Gerlach, Alan M., **Air Force in the International Geophysical Year.** *Air University Quarterly Review*, 8(2):70–84, Spring, **1956. DLC**—A thorough but narrative style review of the purpose and plans for IGY, 1957/8, and the part the Air Force and especially the Geophysics Research Directorate of the U. S. Air Force will play in Antarctic expeditions, upper atmosphere, rocketing, satellite programs, meteorology, geomagnetism, aurora and airglow, ionosphere, solar activity, cosmic rays, longitude and latitude, glaciology, oceanography, seismology, gravity and world days. Institutions contracting with the AFCRC and places where the various research programs will be undertaken, are mentioned in each pertinent section. *Subject Headings:* **1. IGY program 2. U. S. Air Force IGY program.** —*M.R.*

9.3–28 550.3:061.3

Baral, S. S., **International Geophysical Year,** *Science and Culture*, Calcutta, 22(2):61–63, Aug. **1956.** Also, Mitra, Nilima and Mitra, S. N. (*both, New Delhi*) **The International Geophysical Year, 1957–58.** *Ibid.*, p. 83–95. Aug. **1956.** 6 figs. (incl. photo). **DLC**—Cost of IGY estimated at 70 million pounds ($200 million). India participated in several programs of the 2nd Polar Year. It is estimated that data from IGY would run into 1000 volumes, compared to 100 volumes for Second Polar Year and 4 volumes for First Polar Year. The part played by India, participating organizations in India and 9 fields in which studies will be made are outlined. In the second paper, a more detailed coverage of each field and Indian plans for those fields as well as general plans (e.g., rocket soundings) are given. Maps and diagrams illustrate this extensive article. *Subject Headings:* **1. IGY program 2. Indian participation in IGY 3. India.**—*M.R.*

9.3–29 550.3:061.3

Davitaia, F. F., **Gidrometeorologicheskie issledovaniia v Mezhdunarodnom geofizicheskom godu.** [Hydrometeorological research during the IGY.] *Meteorologiia i Gidrologiia*, No. 12:3–8, Dec. **1956.** Beginning with a brief comparison of the activities of Russia in the first and second geophysical year with that of the Soviet Union, the author proceeds to discuse the present IGY program in the fields of meteorology, hydrology and oceanography with particular attention to the special role of the U.S.S.R. in this program. *Subject Headings:* **1. Russian participation in IGY 2. International Geophysical Year, 1957–1958.**—*I.L.D.*

9.3–30 550.3:061.3

Il programma Italiano per l'Anno Geofisico Internazionale. [Italian program for the International Geophysical Year.] *Società Geografica Italiana, Rome, Bollettino*, Ser. 8, 10(4/5):221–223, April/May **1957. DLC**—In this note (taken from *Ricerca Scientifica*, No. 2, 1953, p. 501–503) the Italian IGY program is summed up. Forty-nine stations will participate in the meteorological program and 6 of these will conduct upper-air soundings. Three ionospheric stations will conduct vertical soundings and there will be airglow, auroral and cosmic-ray observations. Other activities will include observation of geomagnetism, solar phenomena, seisms and other geophysical elements. *Subject Headings:* **1. Italian participation in IGY 2. International Geophysical Year, 1957–1958.**—*G.T.*

9.3–31 550.34:061.3

Crary, A. P. (*IGY Offices, Wash., D. C.*), **Seismology and the U. S. IGY program.** *Scientific Monthly*, 83(5):225–231, Nov. **1956.** 4 figs., 7 refs. **DWB, DLC**—In this discussion of

seismology the author includes a description of the nature of microseisms and an account of the IGY program for their investigation. *Subject Headings:* **1. IGY seismology program 2. U. S. participation in IGY.**—*I.L.D.*

9.3–32 551.585.5

Recommendations by the Socorro Conference. (In: White, Gilbert F. (*ed.*), **The future of arid lands.** Wash., D. C., American Association for the Advancement of Science, **1956.** p. 427–435.) **DLC**—The recommendations made at the International Arid Lands Meetings in meteorology and climatology dealt with extension of International Geophysical Year activities to include meteorological and climatological study of the arid lands, increasing the density of meteorological stations, extension of synoptic and dynamic climatological studies in arid lands, etc. *Subject Headings:* **1. Arid zone research 2. Arid zone climatology.**—*I.L.D.*

9.3–33 550.3:061.3

Avsiuk, G. A., **Podgotovka k Mezhdunarodnomu geofizicheskomu godu 1957–1958.** [Preparation for the International Geophysical Year, 1957–1958.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geog.*, No. 2:158–162, **1957. DWB**—Preparatory work for a coordinated and successful carrying out of investigations during the International Geophysical Year in the U.S.S.R., the Antarctic, and abroad are discussed and explained. In the U.S.S.R., the coordination of the program of activities of more than 100 scientific institutions belonging to 18 different departments (319 special observation stations, 2 equatorial stations, 2 drifting stations in the Arctic, 25 expeditions, oceanological investigations made from 43 ships, not less than 3 stations in Antarctica) has been entrusted to the Inter-Departmental Committee. The results of 4 International conferences called together for the purpose of coordinating the program of activities of other nations are discussed, and the activities of Soviet representatives during the meetings and successive visits to foreign scientific institutions are reviewed. *Subject Headings:* **1. International Geophysical Year, 1957–1958 2. Russian participation in IGY.**—*A.M.P.*

9.3–34 551.5:550.3:061.3

Ashford, O. M., **The International Geophysical Year, 1957/1958.** *World Meteorological Organization, WMO Bulletin*, 6(2):56–58, April **1957. DWB**—Notes on the trial period Jan. 15–10, 1957 for IGY data forms to be filled out by member services, alert warnings for World Days and Special World Intervals (SWI), punching of marine met. obs., ozone and sferics data, Nuclear Radiation Working Group of CSAGI, World Synoptic Charts, etc. *Subject Heading:* **1. IGY-WMO program.**—*M.R.*

ARCTIC RESEARCH

See also: **Diurnal stratospheric temp. variations, Arctic** (Belmont), **9.3–193.**

9.3–35 551.311.181(268)

Sverdrup, Harald U., **Arctic sea ice.** (In: **Dynamic North.** Wash., D. C., Technical Assistant to Chief of Naval Operations for Polar Projects, **1956.** Vol. 1, Pt. 6. looseleaf. 17 p. figs., tables, 7 refs. **DWB**—A short but highly informative discussion of several important aspects of Arctic sea ice: I. terminology is discussed under 5 headings: (1) development stages, (2) occurrence, (3) surface features, (4) openings in ice and (5) stages of melting; II. freezing of sea ice; III. temperature of sea ice; IV. salt content; V. melting; VI. physical properties; VII. transformation and seasonal changes; VIII. thickness and transport of material. Interesting processes are explained: e.g., the progressive purification of the ice as the season advances and the salt works downward through the ice; or the differential freezing and melting of the ice occasioned by the varying salt content. (*See also* 51–191, Sept. 1954, *MAB.*) *Subject Headings:* **1. Arctic sea ice 2. Sea ice physics.**—*M.R.*

9.3–36 551.311.184(268)

†Crary, A. P. (*Geophy. Res. Directorate, A. F. Camb. Res. Cen., Camb., Mass.*), **Arctic ice island research.** *Advances in Geophysics*, Ed. by H. E. Landsberg, 3:1–41, **1957.** 17 figs.,

3 tables, 52 refs., 2 eqs. **DWB, DLC**—The article reviews systematically the various studies (and knowledge gained therefrom) of the Arctic Ice Island (T-3) on which the author and other scientists including the discoverer, J. O. FLETCHER, spent some time in March–Oct. 1952 and 1953. (The island was occupied continuously from March 1952–May 1954). The history of Arctic Ocean research and of the ice islands, weather, submarine bathymetry, gravimetric and water mass observations, ice drift, the general appearance of the islands, summer conditions, surface deposits, subsurface character, C-14 dating, theory of formation of ice shelf and of ridge and trough systems, time of break from shelf, seismic studies, rotation (direction and speed) and future of islands are discussed and illustrated by original charts and tables of data. A good general bibliography is appended. *Subject Headings:* **1. Arctic ice islands 2. Fletcher's Ice Island (T-3) 3. Arctic Basin.**—*M.R.*

9.3–37 551.584.43:581.14

*Bliss, L. C. (*Dept. Biology, Bowling Green State Univ., Ohio*), **A comparison of plant development in microenvironments of Arctic and Alpine Tundras.** *Ecological Monographs*, Durham, N. C., 26(4):303–337, Oct. **1956.** 11 figs., 10 tables, bibliog. **DLC**—In this comparative study of microenvironments, rates of plant development and vegetational structure in the Arctic Tundras of Northern Alaska and the Alpine Tundras of the Snow Range in the Medicine Bow Mts. of Wyoming, eight microenvironmental stations were established on various exposures in the Tundras. Measurements were made of solar radiation, air, surface and soil temperatures, precipitation, vapor pressure deficit, wind and soil moisture. These climatic data are presented in tables and graphs. In both Tundras the air temperatures showed higher temperatures at the surface by day and an inversion at night. Soil temperatures decreased more with depth in the Arctic than in the Alpine Tundras. Growing season values of wind, vapor pressure deficit; 4 in. air, surface and 4 in. soil temperatures and solar radiation were in general greater in Wyoming than in Alaska. Soil moisture was lower in the Alpine Tundras with the exception of wet meadows where the soil was constantly saturated as in Alaska. Amounts of summer precipitation were similar in both regions, although winter snow accumulation was greater in Wyoming. "Congeliturbation processes were evident in both Tundras, though permafrost was not encountered in the Alpine Tundras." *Subject Headings:* **1. Plant development comparisons 2. Microclimatic data 3. Arctic 4. Medicine Bow Mountains, Wyoming.**—*I.L.D.*

9.3–38 551.525.4:551.525.5

Cook, Frank A., **Near surface soil temperature measurements at Resolute Bay, Northwest Territories.** *Arctic*, Ottawa, 8(4):237–249, **1956.** 6 figs., 4 tables, 7 refs. **DLC**—The data on near surface soil temperature were obtained in the summer of 1950–53 and in the fall of 1955 when a special study of freeze back in the upper layer was made. The observations were made about a 1000 ft inland from Resolute Bay and on a prominent raised beach line. Temperatures were measured at depths of 4, 8, 19, and 60 in. below the surface; in the freeze back study they were measured of 2, 5, 8, 11, 14, 17 and 20 in. below the surface. Data are presented on the daily fluctuations of soil temperature, and monthly averages of temperature, daily averages of soil temperature for period of freeze back 1955, and on percentage moisture content of the soil during the freeze back. Precipitation during the summer and penetration of the 32°F freezing line and moisture content and migration during the freeze back are discussed. *Subject Headings:* **1. Soil temperature measurements 2. Freezing soil 3. Resolute Bay, Northwest Territories.**—*I.L.D.*

9.3–39 551.501:550.3(98/99)

Dué Rojo, Antonio, **Actualidad geofísica de las regiones polares.** [Present day geophysics of the polar regions.] *Urania*, Barcelona, 40(204):7–16, Jan./June **1955.** 10 refs. **DWB, DLC**—The present status of geophysical exploration of the Arctic and Antarctic is reviewed at some length. Climatic conditions, Arctic weather stations manned by U. S. Weather Bureau and Canadian Meteorological Society, U. S. Air Weather Service flights from Fairbanks to the Pole, Ice Island stations, glaciological studies in Greenland, Antarctic expeditions

of recent years, current plans of various countries, etc. are described. *Subject Headings:* **1. Polar geophysics 2. Arctic weather stations 3. Antarctic expeditions 4. Polar regions.** —*M.R.*

9.3–40 551.311.17(988)

*Heinsheimer, Georg J., **Los glaciares de la Tierra, teniendo en cuenta los resultados de las Expediciones Polares Francesas (Missions Paul-Émile Victor) en Groenlandia.** [Glaciers of the earth, taking into account the results of the French Polar Expeditions (Paul-Émile Victor Missions) in Greenland.] Reprint from *Centro Naval, Buenos Aires, Boletín*, 73(625), Nov./Dec. **1955.** 12 p. 5 tables, 31 refs. Also, bound in, his: **Sobre la cubierta glacial antarctica.** [On the Antarctic glacial cover.] p. 13–16. **DWB**—The latest calculations of the depth and area of the Greenland ice cap give a value for total ice coverage of the earth, 1% greater and for volume of ice 13% greater than previous (FLINT, 1948) estimates. The areas and volumes of the different ice masses are tabulated. In the second article data on ablation, increase and movement of Antarctic glaciers are analyzed and discussed. *Subject Headings:* **1. Ice cover of earth 2. Greenland Ice Cap 3. Ice data 4. Glacial ablation 5. Greenland 6. Antarctica.**—*M.R.*

9.3–41 91.04(988)

Malaurie, J., **The French Geographical Expedition to Thule, 1950–1951: preliminary report.** *Arctic*, Ottawa, 8(4):203–214, **1956.** 9 figs. (incl. photos), 20 refs. **DLC**—The most significant factor in the geomorphology of Northern Greenland (Inglefield Land) is the aridity, the annual precipitation being about 4–5″. "The absence of any wind-rounded grains in recently formed or fluviglacial sands indicates that there is no intense wind erosion today." The character of the inland ice in this region, glacial retreat, etc., are discussed. *Subject Headings:* **1. French Greenland Expedition, 1950–1951 2. Aridity 3. Inland ice 4. Thule, Greenland.**—*I.L.D.*

9.3–42 551.506.5(98) 551.583

†Manning, T. H., **Narrative of a second Defence Research Board Expedition to Banks Island, with notes on the country and its history.** *Arctic*, Ottawa, 9(1/2):3–77, **1956.** 53 photos., 90 refs. **DLC**—A long illustrated descriptive account of author's 1952 expedition to Banks Island in the Canadian Archipelago accompanied by notes on weather, ice conditions, previous exploration, geology, glaciation and pollen analyses indicative of climatic changes there. *Subject Headings:* **1. Climatic variations 2. Arctic expeditions 3. Banks Island, Canadian Arctic.**—*M.R.*

9.3–43 91.04(98)

Rogers, P., **Exploring Greenland.** *World Meteorological Organization, WMO Bulletin*, 5(3):118–119, July **1956. DWB**—Notes on the projected International Glaciological Expedition to Greenland (IGEG) under PAUL-ÉMILE VICTOR, scheduled for 1957–60, and coordinated with IGY but not a part of that program. It will be under the sponsorship of the Commission for Snow and Ice of the International Association of Hydrology (IAH). Scientists of 8 countries met at Jungfraujoch Research Station on April 3–8, 1956 to organize the expedition. Scientists from Germany, Denmark, France and Switzerland will participate. Exploration of the ice cap from JENSEN (1878) to NANSEN (1888), who was first to cross the ice cap, and A. DE QUERVAIN, KOCH and WEGENER, and WATKINS, who made weather observations north of the Arctic Circle in 1931, is reviewed. *Subject Headings:* **1. Greenland expeditions 2. International Glaciological Expedition to Greenland (IGEG), 1957–60. I. Victor, Paul-Émile II. de Quervain, A** —*M.R.*

ANTARCTIC RESEARCH

See also: **Polar geophysics** (Dué Rojo), 9.3–39.

9.3–44 551.510.41:546.21

Kanwisher, John (*Woods Hole Ocean. Inst., Mass.*), **Oxygen in Antarctic air.** *Tellus*, Stockholm, 9(1):137–138, Feb. **1957.** table, 7 refs. **DLC**—Analysis of oxygen content of air

samples collected by P. A. Humphrey on the icebreaker "Atka" in 1955 in the Antarctic and in the tropics at 10°S and 12°N on the voyage to and from the Antarctic, throw considerable doubt on the validity of values reported by earlier expeditions such as Lockhart and Court (1942) in Antarctic and Hock, R. J. et al. (1952) for Point Barrow. Comparison with Woods Hole (42°N, 70°W) air at time of analysis shows the following average values:

Woods Hole	20.94	72°S, 15°W	20.87
12°N, 38°W	20.86	72°S, 131°W	20.83
10°S, 100°W	20.90	73°S, 163°W	20.83
65°S, 65°W	20.87	Lockhart and Court	20.76 to 20.48
69°S, 100°W	20.87	Hock et al. 71°N	20.91 to 20.96

Low values obtained in Arctic and Antarctic may have been due to errors or conditions of sampling and storage, chemisorption of oxygen in the steel cylinders. Values obtained in tropics are not significantly different from those obtained in Antarctic and none are too far below values established for world as a whole 20.93 to 20.96 (Carpenter, 1937 and Paneth, 1937.) *Subject Headings:* **1. Oxygen content of air 2. Antarctic atmospheric composition 3. Antarctica. I. Lockart, E. E. II. Court, A. III. Hock, R. J.**—*M.R.*

9.3–45 91.04(99) 551.501.9(99)

Burkhanov, V. F., **Nauchnye raboty sovetskikh geografov v Antarktide.** [Scientific work of Soviet geographers in the Antarctic.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geog.*, No. 1:6–13, Jan./Feb. **1956.** 2 figs. (1 fold.). **DLC**—The "Ob" left Kaliningrad on Nov. 30, 1955, and the "Lena," and "Refrigerator Ship No. 7" a few days later, for the Antarctic, to establish a lease at Mirnyi and 2 scientific stations at Vostok near geomagnetic pole, and at Sovetskaia near the pole of relative inaccessibility. The leadership, staff, goals and location of these stations are outlined. The main purpose is to determine the effect of the Antarctic on the general circulation of the atmosphere for the purpose of improving long range forecasts. The oceanic circulation, geology, glaciology, history, relief, etc. are also to be studied. Some details are given regarding the scientific program. *Subject Headings:* **1. Soviet Antarctic expedition 2. Russian participation in IGY 3. Antarctic weather stations 4. Mirnyĭ, Antarctica.**—*M.R.*

9.3–46 91.04(99)

Kort, V. G., **Osnovnye rezul'taty pervogo Reĭsa morskoĭ antarkticheskoĭ ekspeditsii Akademii Nauk SSSR.** [Chief results of the first Antarctic Sea Expedition of the Academy of Sciences of the U.S.S.R.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geog.*, No. 2:3–13, **1957.** fig. **DWB**—The main results of the 1955–1956 expedition briefly described in the present paper were: 1) participation in the organization of the scientific base on the Antarctic coast—the geophysical observatory "Mirnyĭ"; 2) carrying out of oceanologic investigations in the Indian sector of Antarctic waters on: a) the basic laws of the movement of Antarctic waters; b) the ice regime and the waves in the South-Polar basin; c) the geological structure of the ocean bottom; d) peculiarities of geophysical phenomena in regions visited by the expedition; and e) the zonal distribution of fauna in the world ocean; 3) the conducting of hydrographic observations and surveys. *Subject Headings:* **1. Antarctic expeditions 2. Oceanographic research 3. Antarctica.**—*A.M.P.*

9.3–47 551.555.6:551.581(99)

Riccardi, Riccardo, **L'antartide e i recenti progressi nella sua conoscenza.** [Antarctica and recent progress in its exploration.] *Società Geografica Italiana, Rome, Bollettino*, Ser. 8, 10(4/5):193–210, April/May **1957.** 4 photos, map (fold.), refs. English summary p. 210. **DLC**—The expeditions which contributed to the exploration of the Antarctic continent are described, and present knowledge on the different properties of the continent is summed up. Climatic properties and glaciological conditions are discussed on pp. 205–208. It is stated that the widely known glacial anticyclone is only a surface phenomenon, as soundings reveal low pressure areas aloft. Near the edge of the continent easterly winds prevail near the ground

and westerlies above 2000 m. The frequent blizzards sometimes have average winds of 140 to 160 km/h with gusts of more than 300 km/h. Mean temperature in coastal areas is 10–12°C below zero, lowest measured so far was −66.8°C, but much lower temperatures are expected near south pole. Cloudiness is very intense, precipitation scarce. *Subject Headings:* **1. Climate of Antarctic 2. Antarctic exploration 3. Blizzards 4. Antarctica.**—*G.T.*

9.3–48 550.3:061.3(99)

Zavatti, Silvio, **Notizie sulle stazioni scientifiche dell'Antartide.** [News on the scientific stations of the Antarctic.] *Società Geografica Italiana, Rome, Bollettino*, Ser. 8, 10(4/5):229–233, April/May **1957. DLC**—Positions of some 20 Antarctic bases and stations maintained by seven nations participating in the IGY program are indicated and latest activities of occupying crews are briefly reported. *Subject Heading:* **1. IGY Antarctic program.**—*G.T.*

9.3–49 91(99)

Zierhoffer, August, **Z problemów geograficznych antarktydy.** [Some geographic problems of the Antarctic.] *Czasopismo Geograficzne*, Warsaw, 27(1):3–11, **1956.** 18 refs. Polish and French summaries p. 11. **DLC**—Discussion of some general geographic problems of the Antarctic. First the question of whether the Antarctic is a continent or a sea is discussed. Then the author presents a historical review and conclusions finally reached by NORDENSKJÖLD, and confirmed by WILKINS' flight over Graham Land in 1928–1929. Concerning the hypsometry of Antarctic, the author opposes A. PENCK's thesis of the upper limit of denudation, and discusses the question: Was the Antarctic continent always higher than other continents, or has it preserved its elevation due to ice protection against denudation? Problems of ice alimentation, its connection with the climate, and of the age of Antarctic glaciers follow. Finally, the questions of the purity of Antarctic ice and the absence in it of rock material complete the paper. *Subject Headings:* **1. Antarctic geography 2. Antarctic hypsometry 3. Antarctic glaciology 4. Antarctica.**—*A.M.P.*

SOCIETIES, INSTITUTIONS, SERVICES

9.3–50 551.574.1:06(791)

Arizona. Univ. Institute of Atmospheric Physics. **General information on the Institute of Atmospheric Physics, University of Arizona, Tucson, Arizona,** April 15, **1955.** 11 p.—The Institute of Atmospheric Physics (DR. ROSCOE R. BRAHAM, JR., Director) of the Univ. of Arizona was founded in 1954 by LEWIS W. DOUGLAS (the Univ. of Chicago Dept. of Meteorology cooperating) to gain fundamental knowledge of the weather and climate of Arizona and of the Southwest. Emphasis has been placed on theoretical studies of the processes of cloud and rain formation rather than cloud seeding operations. Radar and time-lapse photography methods of studying cloud frequency and rain generating processes in connection with orography, and time of day are discussed. Forest service lookouts and U. S. Weather Bureau cooperative rainfall stations supplemented by additional recording equipment furnished by the Institute also take part in the program. A freezing nuclei program, aircraft observations of clouds, statistical climatology, ice crystal cloud studies, solar radiation, and a water vapor content measurements program are described. *Subject Headings:* **1. Arizona Univ. Inst. of Atmospheric Physics 2. Cloud physics research.**—*M.R.*

9.3–51 551.5:061.6

Charles, B. N. (*Sandia Corp., Sandia Base, Alburquerque, N. M.*), **An orographic-climate complex favorable for meteorological research.** *American Meteorological Society, Bulletin*, 37(6):311, June **1956.** photo. **DWB**—The author describes the unique combination of topography, climate and human activity that provide an unusual opportunity for diversified meteorological research near Albuquerque, New Mexico. Various meteorological problems especially suitable for investigation are discussed. These include cloud physics, radar studies of precipitation mechanism, turbulence analyses, etc. *Subject Heading:* **1. Meteorological research.**—*I.L.D.*

9.3–52 551.509(09)(421)

Hawke, E. L., **A historic London weather station.** *Weather*, 12(9):288, Sept. **1957.** 2 plates. **DWB**—In 1855 G. J Symons began collecting rainfall observations in British Isles and issued first collection in 1860 under title **British Rainfall;** in 1868 Headquarters moved to 62 Camden Sq., where he set up a climatological station. On Aug. 8, 1956, station was moved to an enclosure in Camden Sq. itself. *Subject Headings:* **1. Station locations 2. Camden Square, London. I. Symons, G. J.**—*C.E.P.B.*

9.3–53 551.58:061(73)

U. S. Weather Bureau, **Climatological services of the U. S. Weather Bureau, 1955.** Its *Climatological Services Memorandum*, No. 50, Nov. 23, **1955.** 18 p. 12 figs. (incl. folded back cover). **DWB**—This summary of the organization program and activities of the Climatological Services Division of the U. S. Weather Bureau (H. E. Landsberg, Chief) contains an account of the history of the origin and growth of climatological services in the U. S. Weather Bureau, a description of (1) the present organization and its functions, (2) the station network established for climatological needs (climatic network, climatic bench network, etc.), (3) present practices in the processing of meteorological data, (4) the routine climatological publications (Weekly Weather and Crop Bulletin, Local Climatological Data, etc.), (5) the special service program such as upper air summaries, data surveys of foreign areas, etc. Also included are a list of key personnel in climatology in the Climatological Services Division, maps showing weather records processing centers, location of existing and proposed stations and of basic handy network for climatology, a graph showing number of stations in upper air, sounding network, a map of radiosonde stations, sample sheets of Local Climatological Data, a map of total hours of sunshine for the world and an organizational chart. *Subject Headings:* **1. Climatological services 2. U. S. Weather Bureau 3. Climatic networks 4. United States.**—*I.L.D.*

9.3–54 551.5:63:634.8

Weger, N., **Tätigkeitsberichte der Agrarmeteorologischen Dienststellen, Geisenheim.** [Activity report of the Agro-Meteorological Office at Geisenheim.] *Germany. Deutscher Wetterdienst, Mitteilungen*, 2(14):34–40, **1955.** 3 figs. **DWB**—This agrometeorological station situated in the wine producing region of the Rhine region is concerned with studies on the relationships between climate and weather and growth of grapevine, and fruit crops, wine cellar climate, microclimatic mapping of high quality vine culture areas, wind velocity at the ground level, soil moisture content, instrumentations, etc. Graphs are presented showing temperature variations in a storage cellar in 1953, the relative frequency of relative humidity in a storage and in a flask cellar and distribution of soil moisture in frost free and frozen soil. *Subject Headings*: **1. Agrometeorological services 2. Vineyard phenology 3. Wine cellar microclimatology 4. Rhine Region, Germany.**—*I.L.D.*

9.3–55 551.5:63:634.8

Weise, R., **Tätigkeitsberichte der Agrarmeteorologischen Dienststellen, Würzburg.** [Activity report of the Agrometeorological Office at Würzburg.] *Germany. Deutscher Wetterdienst, Mitteilungen*, 2(14):104–109, **1955.** fig. **DWB**—The agro-meteorological service was concerned with methods for improving wine cultivation with special emphasis upon the stand climate associated with various types of cultivation, the influence of the terrain upon stand climate, micrometeorologic observations in vineyard, etc. *Subject Headings:* **1. Agrometeorological services 2. Vineyards.**—*I.L.D.*

9.3–56 061.3:551.5

Flohn, H., **Meteorologen Tagung 1957.** [Meteorological Society meeting 1957.] *Umschau*, 57(22):695, Nov. 15, **1957. DLC**—The recently founded "Meteorological Society of the D.D.R." held its first meeting on Oct. 14–16, 1957, in Berlin. Brief accounts of papers read are given. *Subject Heading:* **1. East German Meteorological Society.**—*C.E.P.B.*

EDUCATION, HISTORY AND BIOGRAPHY

BIOGRAPHY

9.3–57 551.5:92

Retirement [of] Miss E. E. Austin. *Meteorological Magazine*, London, 86(1022):250, Aug. **1957. DWB**—Miss Austin joined the Meteorological Office in July 1918 as Secretary to Sir Napier Shaw, and assisted in preparation of 4 volumes of **Manual of Meteorology.** In 1935 was posted to Climatology Branch. Retired in 1955 but took temporary appointment until June 30, 1957. *Subject Headings:* **1. Biography 2. Austin, E. E.**—*C.E.P.B.*

9.3–58 551.5:92

[Biographical note on] Charles Sumner Durst, O.B.E., B.A., *Meteorological Magazine*, London, 86(1025):343–344, Nov. **1957. DWB**—Retired Sept. 6, 1957, after 38 years in Meteorological Office, London. Marine Division 1919–28, introduced punched card system for meteorological statistics; Cardington 1928–32; Forecast Division till 1940; Special Investigations in connection with Second World War. Then until retirement continued to study problems of air navigation. *Subject Headings:* **1. Biography 2. Durst, C. S.**—*C.E.P.B.*

9.3–59 551.5:92

Knoch, K., **[Biographical note on] Prof. Dr. Hermann Henze 80 Jahre.** [Prof. Henze's 80th jubilee.] *Meteorologische Rundschau*, Berlin, 10(2):41, March/April **1957. DWB**—On 16 April 1957 Dr. Henze was 80. Joined Prussian Meteorological Institute on Oct. 1, 1902 (German Meteorological Service had not yet been unified); retired at end of 1943. Personal assistant to Director G. Hellmann 1907–1922. Worked mainly on rainfall, but also published papers on other climatological elements. *Subject Headings:* **1. Biography 2. Henze, H.** —*C.E.P.B.*

9.3–60 551.5(26):92

Böhnecke, G., **Gedenktage. Konteradmiral a.D.Dr.h.c. Fritz Spiess, 1934–1945 Präsident der Deutsche Seewarte.** [Celebration in honor of Admiral F. Spiess, President of the Deutsche Seewarte 1934–1945.] *Deutsche Hydrographische Zeitschrift*, 9(3):148–149, **1956. DWB**—Aged 75 on Oct. 28, 1956. German Navy 1900–1928 but took up geophysics and commanded "Meteor" expedition of 1925/27, becoming scientific leader also after the death of A. Merz. He took part in other expeditions and as President of the Deutsche Seewarte was much occupied with meteorology. *Subject Headings:* **1. Biography 2. Spiess, F.**—*C.E.P.B.*

9.3–61 551.5:92

Davitaia, F. F., **Aleksandr Ivanovich Voeĭkov (k sorokaletiiu so dnia smerti).** [Fortieth anniversary of the death of Aleksandr Ivanovich Voeĭkov.] *Meteorologiia i Gidrologiia*, Leningrad, No. 3:7–11, March **1956.** port. **DWB, DLC**—While much of Voeĭkov's work in climatology and meteorology was furthered by the extensive meteorological data already available in Russia during his time, the scope of his work was not limited by the available data, and he made original contributions to climatology and meteorology. A brief account is given of Voeĭkov's methodology and of some of his more important scientific achievements. *Subject Headings:* **1. Biography 2. Voeĭkov, Aleksandr Ivanovich.**—*I.L.D.*

9.3–62 551.58

Davitaia, F. F., **A. I. Voeĭkov i ego deiatel'nost' v oblasti klimatologii.** [A. I. Voeĭkov and his work in climatology.] (In: Budyko, M. I. (*ed.*), **A. I. Voeĭkov i sovremennye problemy klimatologii.** Leningrad, **1956.** p. 5–12.) **DWB**—A discussion and evaluation of A. I. Voeĭkov's role in the development of climatology as a science and his contributions to climatology. Voeĭkov's studies included the geographical distribution of solar radiation, the heat balance of the earth, the role of the solar radiation and the distribution of land and water in the formation of climates, the origin of monsoons, the climatic classifications, etc. The writer stresses the practical value of Voeikov's work and the fact that he never separated theory

from practice so that in a sense he is a forerunner of the contemporary Soviet conception of the practical value of science and states that he also wrote the first climatology of the earth. *Subject Headings*: **1. Climatology 2. Voeĭkov, A. I.**—*I.L.D.*

BIBLIOGRAPHY

See also: **Assoc. of Scientific Hydrology** (IUUG), 9.3–64; **German aviation medicine** (U. S. A. F.), 9.3–99.

9.3–63 551.5:061.3:016

Winid, Bogodar, **Miedzynarodowe bibliografie meteorologiczne.** [International meteorological bibliography.] *Przeglad Meteorologiczny i Hydrologiczny*, Warsaw, 8(3/4):276–280, **1955. DWB, DLC**—A brief survey of international bibliographies on meteorology wherein the author enumerates the publications in the order of their appearance, beginning with Fassig's **Classed Catalogue,** published in 1889–1891 by the Signal Office in Washington. After having cited the French **"Bibliographie Météorologique Internationale"** appearing since 1921, the author gives a long review of **"Meteorological Abstracts and Bibliography"** published monthly since 1950, by the American Meteorological Society. Others mentioned are: *Referativnyĭ Zhurnal* edited by Academy of Sciences of the U.S.S.R. with its section **Physics of the Atmosphere** since 1954, the bibliographic sections on meteorology of the German **Geographisches Jahrbuch,** etc, in much the same order as these references appear in the Meteorological Abstracts and Bibliography, **Bibliography of Bibliographies** (*see* 6(1):82–118, Jan. 1955, *MAB*). *Subject Headings:* **1. International meteorology bibliographies 2. Meteorology bibliographies.**—*A.M.P.*

9.3–64 551.579:016

†International Union of Geodesy and Geophysics. Association of Scientific Hydrology, **[International Bibliography of Hydrology.] Hydrologische Bibliographie, Deutschland,** [Hydrological bibliography, Germany], **1952 and 1953.** pub. Koblenz, **1956.** 2 vol. about 100 p. each. 484 and 490 items. Also **Vol. 12, 1954,** pub. Berlin. Akademie Verlag, **1957. DWB**—These annual hydrological bibliographies follow the standard pattern for Germany, and for other countries as presented by the IAH of the IUGG. The approximately 500 items (some annotated) in each of the 1952 and 1953 volumes are distributed among 42 headings grouped into 9 major categories: I. Hydrometeorology, II. Rivers and watercourses, III. Lakes, IV. Glaciers, V. Ground water and springs, VI. Water balance, VII. Application of other disciplines to hydrology, VIII. General works, IX. Miscellaneous. An author index is appended. (For 1936–1950 issues, *see* 6A–85, Jan. 1955; for 1951 issue, *see* 7.5–54, May 1956, *MAB*.) *Subject Headings:* **1. Hydrology bibliographies 2. Germany.**—*M.R.*

9.3–65 551.582:016(988)

*†Bender, T. A.; Carraway, D. M.; Grimes, A. E. et al., **Bibliography on the climate of Greenland.** U. S. Weather Bureau, Foreign Area Section, Office of Climatology, Aug. **1957.** 473 p. 469 titles with abstracts (many cited from **Meteorological Abstracts and Bibliography**). **Listing of Expeditions,** p. 263–264. Subject classification (two lists, one alphabetical, one Decimal classification), p. 265–272. Author index, p. 273–287. Data survey, p. 291–473. **DWB**—A compilation of 469 annotated references (some annotations several pages long) to works on the climate of Greenland, arranged by 10-year periods beginning 1950–1956 (177 items), 1940–49 (83 items), 1930–39 (79 items), 1920–29 (45 items), 1910–19 (22), 1900–09 (14) and prior to 1900 (47 items). A list of 25 expeditions and indexes according to subjects (alphabetical) plus a systematic (U.D.C.) subject and an author index, and an index of data sources with types of data in each (given in great detail) are appended. *Subject Headings:* **1. Bibliography on climate of Greenland 2. Climate of Greenland 3. Greenland. I. Putnins, P. H. II. Spano, A. F. III. Vitale, C. S. IV. Wallace, J. A.**—*M.R.*

9.3–66 551.582.1:016(988)

†Hastings, Andrew D., Jr., **Climatic information sources for Greenland.** *U. S. Quartermaster Research and Development Center, Natick, Mass., Environmental Protection Research*

Div., Research Study, Report RER-11, Jan. **1957.** 27 p. 275 titles. **DWB** (M86 U585re (RER-11)—A list of 82 stations on Greenland, together with general region, years and dates of record, elevation, latitude and longitude, plus a bibliography of 275 selected references to literature on the climate of Greenland or some phase thereof. References were mainly taken from *MAB*, the *Arctic* or the *SIPRE* bibliographies. Articles and works are listed alphabetically by author, and contain no annotations. A simple geographic and expeditive "key" or index is appended. *Subject Headings:* **1. Bibliography on climate of Greenland 2. Climate of Greenland 3. Greenland.**—*M.R.*

9.3–67 551.582:016(88)

†Roman, Simon J. (*Foreign Area Sec. Office of Climatology*), **Bibliography on the climate of the Guianas.** Washington, D. C., U. S. Weather Bureau, Aug. **1957.** 31 p. **DWB** (M016 U587bg)—A compilation of 92 annotated references to works on the climate or meteorology of British and French Guiana or Surinam, or the general area. The references are arranged alphabetically by author; a systematic (U.D.C.) and a subject heading index are appended. Works cited cover 1846–1957. *Subject Headings:* **1. Bibliography on climate of the Guianas 2. Climate of the Guianas 3. British Guiana 4. Surinam.**—*M.R.*

9.3–68 551.582:016(496,56)

†Peterson, A. D. and Zikeev, Nina (*S.*), (*comps.*), **Bibliography on the climate of Turkey.** Wash., D. C., U. S. Weather Bureau, May **1957.** 27 p. **DWB**—A list of 81 annotated references to articles on the climate of Turkey or of particular areas or places in Turkey. A subject and a systematic index is provided. *Subject Headings:* **1. Climate of Turkey 2. Bibliography on climate of Turkey 3. Turkey.**—*M.R.*

9.3–69 551.582:016(55)

†Peterson, A. Delbert (*Office of Climatology, U. S. W. B.*), **Bibliography on the climate of Iran.** Washington, D. C., U. S. Weather Bureau, July **1957.** 26 p. **DWB** (M016 U587bir)—A compilation of 84 annotated references to articles or works on the climate of Iran, arranged alphabetically by author in 2 sections: 1) primary bibliography (35 references) and 2) secondary bibliography (supplementary compilation of 49 references), each with a brief class index and subject heading index. A few works on separate cities or localities in Iran are listed at the end of each of the 2 sections, alphabetically under the place name. *Subject Headings:* **1. Bibliography on climate of Iran 2. Climate of Iran 3. Iran.**—*M.R.*

APPLIED METEOROLOGY

MARINE METEOROLOGY AND OCEANOGRAPHY

See also: **First Soviet Antarctic Sea Exped.** (Kort), 9.3–46; **Biog. of F. Spiess, pres. of Deutsche Seewarte, 1934–45** (Böhnecke), 9.3–60; **Hurricane tide forecasting** (Conner et al.), 9.3–160; **Water level and currents during North Sea storm, 1953** (Fedorov), 9.3–177; **North Sea storm, 1953** (Poncelet), 9.3–178; **Ocean-atmos. interaction** (Palmén), 9.3–202.

9.3–70 551.46(266)

*Love, Cuthbert M. (*comp.*), **Northeast Pacific Ocean physical and chemical data, summers of 1955 and 1956: a preliminary tabulation of oceanographic data collected by M.V. Brown Bear and M.V. John N. Cobb.** Washington (State). Univ. Dept. of Oceanography, Contract Nonr-477(10) and Contract Nonr-477(01), Technical Report, No. 55, Aug. **1957.** 104 p. 3 figs., 8 refs. Almost entirely tables. **DWB** (551.46 W317n)—Data obtained on cruises of the Univ. of Washington's "Brown Bear" and the U. S. Fish and Wildlife Service vessel "John N. Cobb" during the summers of 1955 and 1956 in the Pacific Ocean off the coasts of Washington, Oregon and N. California are presented *in extenso*. Charts show location of sampling stations where temperature, salinity, density, oxygen and dissolved phosphate content were obtained at different depths. Personnel are listed, previous reports cited, equipment and methods described. Each set of observations contains data on wind, sea, weather,

visibility, cloud and temperature of air. Most of the soundings were limited by the bottom to <1500–2000 m but one sounding to 3900 m (13,000 ft) was obtained on July 29, 1956 at 44°N, 140°W, the most S.W. point of the cruise. *Subject Headings:* **1. Oceanographic cruise data 2. "Brown Bear" Cruise 3. Northeast Pacific.**—*M.R.*

9.3–71 551.46:532.59(261)

*U. S. Beach Erosion Board, **North Atlantic coast wave statistics hindcast by the wave spectrum method.** Its *Technical Memorandum*, No. 57, Feb. **1955.** 23 p. numerous figs. and tables, 11 refs. **DWB** (551.46 U582b)—Techniques developed by NEUMANN, PIERSON and JAMES were used instead of the SVERDRUP-MUNK method, for calculating and predicting significant wave characteristics for 4 selected stations between Nova Scotia and Cape Hatteras. The present method deals with wave energy spectra rather than with significant wave character, and it also differs in the minimum fetch and minimum duration of wind needed for development of a full "sea." The bulk of the report consists of wave "roses" and statistical hindcast data for each station. Verification of "hindcasts" and annotations on the compilation of data, spectra, etc. are given in text. *Subject Headings:* **1. Ocean wave spectra hindcasting 2. North Atlantic Coast, United States.**—*M.R.*

9.3–72 551.509.21

*Hamburg. Seewetteramt, **Wetterkarte des Seewetteramtes,** Vol. 5, no. 244–273, Sept. 1–30, **1957.** 30 sheets (fold.), 30×42 cm. **DWB**—Each of these well-analyzed weather maps of the North Atlantic (including NE Canada and Greenland) and Europe (including the Norwegian and Barents Seas to 85°N), contains an inset upper level (500 mb) chart, and on the back, 6-hourly weather reports from 7 lightships, 12 coastal and harbor stations and 12 inland stations in Germany, and abridged reports from 60 foreign stations. Each report also contains on the cover page a different summary: the weather for the week or month, an account of an unusual weather event, an article on agriculture or marine meteorology, on the Antarctic or World weather (from CLIMAT bulletin) of the previous month. These articles are signed by M. RODEWALD, E. HÖLLER, DR. PFLUGBEIL, E. FRANKLIN, and H. SEILKÖPF on subjects in their respective bailiwicks. *Subject Headings:* **1. Daily weather reports 2. Daily weather maps 3. Observational data 4. North Atlantic 5. Europe 6. Germany.** —*M.R.*

9.3–73 535.3:535.245:551.463

Waterman, Talbot H. (*Yale Univ. Osborn Zoological Lab.*), **Polarization patterns in submarine illumination.** *Science*, 120(3127):927–932, Dec. 3, **1954. DLC**—Polarization patterns of submarine illumination in the upper layers of the sea near Bermuda have been observed by means of a sensitive detector and analyzer, which produces an oriented interference figure when traversed by linearly polarized light. Underwater polarization was found to consist of two primary components, one directly transmitted through the surface from the blue sky, the other originating in the water itself and being nearly everywhere oriented at right angles to the direction of penetrating light. As a result of their ultimate dependence on the sun's position both of these components were found to undergo marked changes during the course of the day. *Subject Headings:* **1. Underwater polarization 2. Submarine illumination.**—*From author's abstract.*

9.3–74 546.79:551.464:662.2:539.1

Model, Fr., **Isotope und Ozeanographie: ein Literaturbericht.** [Isotopes and oceanography: a literature summary.] *Deutsche Hydrographische Zeitschrift*, 8(5):203–206, **1955.** 8 refs. **DWB**—The literature (mainly German and Japanese) of the spread of radioactive products of the Bikini bomb test in ocean waters is discussed. Problems of the proportion of heavy water in ice and water, and radioactive isotopes in marine deposits are also mentioned. *Subject Headings:* **1. Bikini atom bomb tests 2. Radioactivity of sea water.**—*C.E.P.B.*

9.3–75 551.465

Mosby, H., **Oberflächenströmungen in der Meerenge bei Tromsö.** [Surface currents in the narrows near Tromsö.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A,*

4 figs., 7:378–384, **1954.** German, English and French summaries p. 378. **DLC**—Tidal currents in nearly calm weather were observed with theodolite on floating objects. Normal north and south currents are plotted. The complex effects of changes of wind force and direction are described. *Subject Heading:* **1. Ocean currents.**—*C.E.P.B.*

9.3–76 551.465:551.509.39(02)

Miche, Robert, **Propriétés des trains d'ondes océaniques et de laboratoire: évolution et amortissement, compte tenu des résistances passives.** [Properties of trains of waves in the ocean and in a laboratory: development and decay, taking account of passive resistance.] *France. Comité d'Océanographie et d'Études des Côtes,* [*Publication*] No. 135, **1954.** 447 p. 55 figs., 21 tables, 17 refs., 141 eqs. **DLC**—As a guide to ocean wave analysis and forecasting, the physical and statistical properties of waves and wave trains are covered in 25 chapters divided into 4 main sections: 1) general, theory, origin, steady state, analysis; 2) dissipation of energy of waves in laboratory and in nature in the steady state; 3) development and decay of transitory ocean waves considering passive resistance; 4) general and statistical properties of stable regimes with fluctuating movements. *Subject Headings:* **1. Ocean wave forecasting textbooks 2. Ocean wave analysis 3. Textbooks.**—*M.R.*

9.3–77 532.59:551.465

Neumann, Gerhard (*College of Engr., New York Univ.*), **On wind-generated wave motion at sub-surface levels.** *American Geophysical Union, Transactions,* 36(6):985–992, Dec. **1955.** 4 figs., 2 tables, 8 refs., 20 eqs. **DWB, DLC**—The characteristics of ocean waves at subsurface levels are derived on the basis of wave spectra as a function of depth. It is shown that the decrease of total wave energy in the composite wave motion with depth is much less than would be expected for a "significant" wave of the same energy at the sea surface. The wave properties change considerably with increasing depth as a result of the different attenuation of the individual wave components in the spectra. A dimensionless parameter which contains both of the variables, wind velocity and depth, simplifies the graphical representation of the derived relationships and their practical application for determining the properties of sub-surface wave motion. *Subject Headings:* **1. Submarine wave theory 2. Ocean wave theory.** —*Author's abstract.*

9.3–78 551.465:621.396.9

Roll, H. U., **Seegangsmessung. Ein neues Anwendungsgebiet des Radargerätes.** [Measurement of sea disturbance: a new application of radar.] *Umschau,* 54(20):618–619, Oct. 15, **1954.** 2 figs. **DLC**—Describes with example the interpretation of radar reflections due to swell and wind waves. A histogram shows distribution of wave lengths in a wind sea. Radar is a cheap and easy method of measuring wave lengths. *Subject Heading:* **1. Radar echoes from sea.**—*C.E.P.B.*

ASTRONAUTICS—SATELLITE OBSERVATORIES

9.3–79 551.507.362.2

Bergaust, Erik and Beller, William, **Satellite!** Foreword by Hermann Oberth. N. Y., Bantam Books, **1956.** 176 p. figs. **DLC**—A pocket-size reprint (1957) of a book for popular consumption on the work of Project "Vanguard"—the U. S. satellite program and the IGY. The scientific uses of the satellite are emphasized, but the more technical and the speculative aspects are given considerable attention. Space travel, for animals and men, is the ultimate goal of the research and development work. Historical developments, astrophysical and astrodynamical considerations, tracking problems, space platforms, ballistic missiles, etc., are all discussed. *Subject Headings:* **1. Astronautics 2. Satellite observatories 3. International Geophysical Year, 1957–1958.**—*M.R.*

9.3–80 551.507.362.2

Jensen, Jorgen (*The Glenn L. Martin Company, Baltimore*), **Satellites.** *Aeronautical Engineering Review,* N. Y., 15(9):44–47, Sept. **1956.** photo., 9 refs. **DLC**—Problems connected with: 1) earth satellite launching, 2) unmanned space flight (the moon rocket) and

3) manned space flight are discussed. The biggest problem is accuracy of direction and speed which must be within 2.5° and 1%, respectively, for the satellite, and 0.5° and 1% for the moon rocket if the flights are to be successful. Another problem is that of tracking, and for manned or moon rockets, that of breaking. Atomic energy could produce fast streams of ions which would be efficient over long periods of time for control or breaking, though insignificant for initial thrust. Uses are suggested such as weather or time observatories, navigation control or radio-TV relay. *Subject Headings:* **1. Satellite observatories 2. Moon rocket.**—*M.R.*

9.3–81 551.507.362:629.19

de Nike, John (*Glenn L. Martin Co., Baltimore*), **Effect of the earth's oblateness and atmosphere on a satellite orbit.** *Franklin Institute, Phil., Journal of the Franklin Institute Monographs*, No. 2:79–88, June **1956.** 4 figs., 5 eqs. **DWB**—Orbital characteristics of a satellite over an oblate earth with and without drag from the earth's atmosphere are calculated on a IBM 701 computer and shown graphically as loss in apogee and perigee altitude in thousands of feet, latitude of apogee and perigee and longitude of apogee and perigee, and finally the orbital characteristics over a spherical earth with drag. *Subject Headings:* **1. Satellite orbits 2. Drag effect of atmosphere.**—*M.R.*

9.3–82 551.507.362:621.38

Merrill, Harrison J. (*Signal Corps Eng. Labs., Ft. Monmouth, N. J.*), **Satellite tracking by electronic instrumentation.** (In: Van Allen, James A., ed., **Scientific uses of earth satellites.** Ann Arbor, Univ. of Michigan Press, **1956.** p. 29–38. 2 figs., 3 tables, 4 refs.) **DWB, DLC**—Certain characteristics which warrant consideration in the passive detection and tracking of the satellite emphasize the usefulness of optical techniques. In planning for the use of existing equipment, it becomes apparent that there are essential differences between satellite tracking and astronomical observations or missile tracking. The problems associated with the satellite are due principally to the diminished contrast against the sun-illuminated sky and to the tracking acceleration component and the concomitant instrumentation jitter. Improvements in the optical compatibilities of the tracking and location instrumentation can be developed if combinations of electronic techniques are utilized which have characteristics more suitable than photographic film or the eye. These improvements are associated with superior time constants, background elimination, utilization of the optimum spectral region, and the superior characteristics of the electronics in the servo tracking loop. *Subject Headings:* **1. Satellite tracking 2. Electronic recorders.**—*Author's abstract.*

9.3–83 551.510.535:551.507.362

Pfister, Wolfgang (*Ionospheric Physics Lab., Geophysics Research Directorate, Air Force Cambridge Research Center*), **Study of fine structure and irregularities of the ionosphere with rockets and satellites.** (In: Van Allen, James A., ed., **Scientific uses of earth satellites.** Ann Arbor, Univ. of Michigan Press, **1956.** p. 283–291. 2 figs.) **DWB, DLC**—Almost all experiments using the ionosphere as a propagation medium reveal the presence of irregular or blobby structure in the electron distribution, and, consequently, a variety of methods is in use to determine something about the blobby structure, either by propagation through the ionosphere as in the radioastronomic technique or by reflection within the layers. Only limited information is available from rocket experiments, but due to the fact that a rocket or satellite travels in the midst of the ionosphere, experiments using transmissions between the vehicle and the ground will be able to add a new and very valuable type of information. Up to now, the contribution of the irregularities has been looked at more as a nasty by-product which must be smoothed out in the data analysis. However, from the data available, an analysis in terms of irregular structure appears to be quite promising. Based on experience with known techniques, a set of experiments for a satellite is being proposed. It is a combination of the pulse-delay experiment similar to the Air Force electron-density rocket experiment with a kind of drift-type experiment measuring the signal amplitude fluctuations at three closely spaced receivers. The real advantage of the fine-structure experiment with satellites or rockets will be that the changing aspect allows us to gain a three-dimensional picture of the configuration of the blob, while so far we are used to looking only at the two-dimensional

diffraction pattern at the ground. *Subject Headings:* **1. Satellite ionospheric fine structure studies 2. Satellite ionospheric irregularities 3. Satellite ionospheric electron distribution.**—*Author's abstract.*

9.3–84 551.507.362 :550.381

Singer, S. Fred (*Univ. of Maryland*), **Measurement of the earth's magnetic field from a satellite vehicle.** (In: Van Allen, James A., ed., **Scientific uses of earth satellites.** Ann Arbor, Univ. of Michigan Press, **1956.** p. 215–233. 4 figs., 36 refs., eqs.) **DWB, DLC**—**Part A, Measurement of the Earth's Main Field and its Secular Variations.** The main advantages of a satellite over other methods are described. We conclude that it should be possible to get a better description of the main field and to study in greater detail the motions of eddies in the earth's core. **Part B, Short Time Variations of the Field and Atmospheric Current Systems.** The satellite magnetometer by being located above the ionosphere observes the magnetic fields produced by atmospheric current systems in opposite phase when compared to a sea-level magnetometer; both instruments, however, observe currents external to the earth's atmosphere (the presumed STÖRMER ring current) in the same phase. This technique therefore allows determination of the location and strength of the currents responsible for magnetic storms at low latitudes and in the auroral zones, as well as for the disturbed and quiet diurnal variations. Such measurements allow us to decide between different theories for the magnetic-storm currents. **Part C, Transient Variations.** Aside from quasi-steady-state effects, transient variations produced by rapid motions of ionized gas near the earth are of interest. They produce sudden magnetic commencements and other rapid variations of the earth's field. A physical model is presented in which the approach and penetration of a magnetohydrodynamic shockwave gives rise to a sudden commencement increase. Satellite observations can give us information of crucial importance by locating the position of the SC currents and by overcoming the ionosphere shielding effects. Appendix I discusses the proton free-precession magnetometer, operating principles, sources of error, problems of data storage and telemetering. Appendix II discusses a proposed model experiment to verify some crucial points of the magnetohydrodynamic shockwave model advanced in Part C. Appendix III discusses some parameters of this shockwave in the interplanetary space. *Subject Headings:* **1. Satellite geomagnetic field measurement 2. Magnetometers 3. Störmer ring.**—*Author's abstract.*

9.3–85 551.507.362 :551.510.3

Spitzer, Lyman, Jr. (*Princeton Univ. Observatory*), **On the determination of air density from a satellite.** (In: Van Allen, James A., ed., **Scientific uses of earth satellites.** Ann Arbor, Univ. of Mich. Press, **1956.** p. 99–108. 8 refs., 10 eqs.) **DWB, DLC**—Methods are analyzed for determining upper-air densities by means of a satellite, either by measures of the orbit or by measures of the change in orientation of a suitably designed vehicle. The orbital method gives enormous accuracy for the air density at perigee altitude, but fluctuations of perigee density with time may prevent accurate density determinations at heights much above the perigee altitude. If a satellite is designed so that its center of pressure is far from its center of mass, measures of the change in orientation with time can, in principle, determine air densities much less than the probable density of 4×10^{-15} gm/cm^3 at 300-km height. For a spinning satellite of about the weight and size planned for the IGY, a measurement of the precession rate by means of photocells observing the sun and the earth would permit measuring air densities as low as 10^{-16} gm/cm^3, after eddy currents produced by the earth's magnetic field increased the spin period to about 100 sec. *Subject Headings:* **1. Satellite density measurements 2. Upper atmosphere density.**—*Author's abstract.*

9.3–86 551.591.6 :551.507.362 :629.19

Stakutis, V. J. and Brennan, Joseph X., Capt. USAF (both, *Geophysics Research Directorate, Air Force Cambridge Research Center*), **Visibility from a satellite at high altitudes.** (In: Van Allen, James A., ed., **Scientific uses of earth satellites.** Ann Arbor, Univ. of Michigan Press, **1956.** p. 137–146. figs., 2 refs., 3 eqs.) **DWB, DLC**—The determination of the visual range or visibility at any altitude depends, in great measure, on the contrasting luminances of the viewed object and its background. Methods and instrumentation employed on

balloon flights for observing the pertinent physical quantities are proposed for extension to satellite vehicles and altitudes. The simple design of two types of instrumentation for measuring the luminous quantities is described briefly to show their applicability to satellite installation. The essential element of the instrumentation is a Weston photronic barrier-layer cell equipped with a viscor filter which responds to light flux in a manner very similar to that of the human eye. Provision is made for changing the material of lenses and photocells for increased sensitivity and durability under high-altitude conditions. One photometer unit observes sky background luminance directly. The second unit measures the illumination of the viewed surface so that the object's brightness (luminance) is calculable through its surface reflectance. A minimum number of photometer units, arranged for viewing in the azimuth and zenith directions, is suggested for a first effort because the actual limitations of weight and telemetering are still uncertain. The maximum desired arrangement would be a nearly spherical studding of the satellite with photometers. From the observed quantities of luminance and illuminance it should be possible to arrive at directional contrast values, contrast reduction, attenuation coefficients, and an estimate of degree and type of scattering. The effect of altitude on such values can be realized by comparison with similar data acquired at balloon and aircraft levels. The final result of visual range is to be determined from nomogramic methods based on the investigations of the Tiffany Foundation. Examination of the visual spectral distribution and polarization phenomena is not considered for a first series of experimental flights. *Subject Headings:* **1. Visibility from satellites 2. Satellite instrumentation.**—*Authors' abstract.*

9.3–87 551.521.9:551.594.51:551.507.362:629.19

Van Allen, James A. (*St. Univ. of Iowa*), **Study of the arrival of auroral radiations.** (In: Van Allen, James A., ed., **Scientific uses of earth satellites.** Ann Arbor, Univ. of Michigan Press, **1956.** p. 188–193. 4 figs., 5 refs.) **DWB, DLC**—The soft radiation discovered by the Iowa group above 50 km at auroral latitudes in 1953 and further studied during 1954 and 1955 provides a novel foundation for plotting out the auroral zone by direct observation. A satellite in a nearly pole-to-pole orbit is a splendid vehicle for this purpose. If such orbits are not available in the near future, a good start on the problem can be made by means of balloon-launched, two-stage, solid-fuel rockets, fired along a meridian over a 10° span of latitudes including the auroral zone. *Subject Heading:* **1. Satellite auroral radiation observation.**—*Author's abstract.*

9.3–88 551.521.64:551.507.362:629.19

Van Allen, James A. (*State Univ. of Iowa*), **Cosmic-ray observations in earth satellites, Pt. A, Geographical dependence and temporal variations of cosmic ray intensity in the vicinity of the earth. Pt. B, Relative abundance of heavy nuclei in the primary cosmic radiation.** (In: Van Allen, James A., ed., **Scientific uses of earth satellites.** Ann Arbor, Univ. of Michigan Press, **1956.** p. 171–187. 8 figs., 2 tables, 17 refs.) **DWB, DLC**—Part A. A single Geiger tube or scintillator carried in a satellite will make possible the study of the cosmic-ray intensity above the atmosphere on comprehensive geographical and temporal bases for the first time. The interpretation of expected data is outlined with respect to the following: determination of the effective geomagnetic field; the magnetic rigidity spectrum of the primary radiation; time variations of intensity and their correlations with solar and magnetic observations and with the observed intensity of secondaries observed in ground stations; and cosmic-ray albedo of the atmosphere. The monitoring function of a satellite will be especially valuable for providing for the IGY period. The ideal data-transmission system and several practical compromises are discussed with regard to their consequences on the fullness of the data. Part B. Satellite-borne instrumentation is uniquely able to solve one of the outstanding problems of the astrophysical nature of the primary cosmic radiation—namely, the abundances of Li, Be, and B nuclei. It is proposed to use a Cerenkov detector for this purpose. The technique has been developed and used intensively by this laboratory in balloon experiments. Balloon apparatus suffers from the serious handicap of the residual atmosphere overhead; conventional rockets spend much too little time above the appreciable atmosphere. It appears to be feasible to fly a simplified version of this type apparatus in a satellite. Data can be accumulated for a complete revolution and played back in a 10-sec interval centered

round passage over a meridian chain of telemetering receiving stations. The initial objective will be to measure the ratio of the sum of intensities of Li, Be, and B nuclei to the sum of the intensities of all heavier nuclei. *Subject Headings:* **1. Satellite cosmic ray observation 2. Cosmic ray intensity 3. Primary cosmic rays.**—*Author's abstract.*

9.3–89 550.381:551.507.362:629.19

Vestine, E. H. (*Carnegie Institution of Washington, Dept. of Terrestrial Magnetism*), **Exploring the atmosphere with a satellite-borne magnetometer.** (In: Van Allen, James A., ed., **Scientific uses of earth satellites.** Ann Arbor, Univ. of Michigan Press, **1956.** p. 198–214. 7 figs., 30 refs., 2 eqs.) **DWB, DLC**—The various electric-current systems suggested for explaining the known geomagnetic variations at ground level are briefly described. Their influence upon measured signals of magnetic intensity aboard a satellite is estimated for motion below, within, and above the current systems. In the case of currents causing magnetic disturbance or storms, it seems likely that estimates of currents flowing beyond the atmosphere can be made, as has previously been pointed out by CHAPMAN. For instance, if a satellite provides new magnetic data, measurements within the F region may suffice to separate the so-called ring-current effect from that due to currents flowing near or within the E-region. Since there must be dynamo effects in the ionosphere, magnetic fields of both poloidal and toroidal types can be measured. The toroidal fields will not ordinarily be detectible at ground level. The local irregularities in electric-current flow will produce time fluctuations which may be difficult to interpret, but with the help of ground observations, these fluctuations may indicate important dynamic and spatial properties of ionized regions. Estimates of precision of measurements required are supplied in the case of the various supposed current systems, taking into account the earth's main magnetic field. The desirability of measuring X-ray and other radiation simultaneously with the magnetic changes is emphasized. Finally, the possible relationship of potential successes in magnetic measurements is discussed briefly with regard to time fluctuations in other phenomena such as ionospheric motions, cosmic rays, and aurorae. *Subject Headings:* **1. Satellite-borne magnetometers 2. Magnetic disturbances 3. Magnetic intensity observation 4. Ring currents.**—*Author's abstract.*

9.3–90 551.507.362:629.19

LaGow, Herman E. (*U. S. Naval Research Lab., Wash., D. C.*), **Experiments for measuring temperature, meteor penetration, and surface erosion of a satellite vehicle.** (In: Van Allen, James A., ed., **Scientific uses of earth satellites.** Ann Arbor, Univ. of Michigan Press, **1956.** p. 68–72. fig., 4 refs.) **DWB, DLC**—Satellite experimentation represents a tremendous step from rocket instrumentation. It offers obvious advantages in studying variations in physical quantities in time and latitude and perhaps even altitude. However, there are several evident disadvantages. The chief disadvantage is the limited payload. Not only does the instrumentation have to be two orders of magnitude lighter than rocket instruments, but it must last from one to five orders of magnitude longer. This means that the instrumentation must be miniaturized to the limit. To do this reliably, one must know the environment in which the instrumentation is required to operate. Some of the environmental conditions can be estimated from theory and rocket soundings, but others must be evaluated from measurements on the satellite. Plans are described for measuring temperature extremes, surface erosion, and surface penetration. *Subject Headings:* **1. Satellite instrumentation 2. Satellite temperature calculations 3. Satellite surface erosion.**—*Author's abstract.*

AERONAUTICAL METEOROLOGY

See also: **Drop impingement on airfoil** (Brun et al.), 9.3–230.

9.3–91 551.552:656.71

Gerlach, C. E. (*Stuttgart*), **Die Berücksichtigung des Seitenwindes bei der Entwicklung neuzeitlicher Startbahnsysteme auf Flughäfen.** [Consideration of cross winds in the development of modern runway system at airports.] *Zeitschrift für Flugwissenschaften*, Brunswick, 1(6):149–155, Nov. **1953.** 9 figs., 4 tables, 2 refs. English and French summaries p. 149.

DLC (TL503.W557)—The influence of cross winds on the design of runways, and on take-off and landing operations is considered quantitatively (by means of graphs and nomograms) and discussed. Use of this knowledge in laying out runways in the early years of aviation, and the changes necessary during the past 20 years because of high speed planes and fixed traffic patterns, are discussed and illustrated schematically and by actual runway plans of Kansas City and Geneva-Cointrin airports. One of the main innovations has been parallel runways. *Subject Headings:* **1. Airport runway design 2. Airport landing conditions 3. Cross winds.**—*M.R.*

9.3–92 551.551.5:629.13

Copp, Martin R. and Fetner, Mary W. (*Langley Aeronautical Lab., Langley Field, Va.*), **An analysis of airspeed, altitude, and acceleration data obtained from a twin-engine transport airplane operated over a feeder-line route in the Rocky Mountains.** *U. S. NACA, Technical Note* 3750, Oct. **1956.** 23 p. 9 figs., 4 tables, 10 refs. **DWB, DLC**—Time-history data of airspeed, altitude, and acceleration obtained with the NACA VGH recorder from a twin-engine airplane operated by a regional feeder airline in the Rocky Mountains are evaluated to determine the magnitude and frequency of occurrence of gusts and gust accelerations and the operating airspeeds and altitudes. The results obtained are compared with the results previously obtained from a representative short haul and long-haul operation. *Subject Headings:* **1. Gust loads on airplanes 2. Rocky Mountains.**—*NACA abstract.*

9.3–93 551.551.5:629.13

Diederich, Franklin W. (*Head, Dynamic Loads Analysis Section, Langley Aeronautical Lab., NACA*), **The dynamic response of a large airplane to continuous random atmospheric disturpances.** *Journal of the Aeronautical Sciences*, N. Y., 23(10):917–930, Oct. **1956.** 9 figs., 18 refs., 61 eqs. **DLC**—The effect on airplane flight of one dimensional gusts (i.e., gusts affecting the motion in a forward direction only) has been thoroughly studied, but the effect of lateral motions as well as lengthwise gustiness has not been carefully worked out. This study goes into a number of details regarding these "two-dimensional" random motions including calculation of the aerodynamic forces, gust loads, stresses on flexible and rigid wings, spectrum of lift due to turbulence, mean square rolling acceleration and root bending moment, etc. *Subject Headings:* **1. Gust loads on airplanes 2. Two-dimensional gust loads.**—*M.R.*

9.3–94 551.578.11:629.13

*Gelder, Thomas F.; Smyers, William H. and von Glahn, Uwe (*all, Lewis Flight Propulsion Lab., Cleveland, Ohio*), **Experimental droplet impingement on several two-dimensional airfoils with thickness ratios of 6 to 16 percent.** *U. S. National Advisory Committee for Aeronautics, Technical Note* No. 3839, Dec. **1956.** 77 p. 25 figs. (incl. photos.), numerous tables, 24 refs., 4 eqs. **DWB, DLC**—The rate and area of cloud droplet impingement on several two-dimensional swept and unswept airfoils were obtained experimentally in the NACA Lewis icing tunnel with a dye-tracer technique. Airfoil thickness ratios of 6 to 16 percent, angles of attack from 0° to 12°, and chord sizes from 13 to 96 inches were included in the study. The results are presented in the form of dimensionless impingement parameters in order to cover a wide range of flight and atmospheric conditions. *Subject Heading:* **1. Drop impingement on airfoil.**—*NACA abstract.*

9.3–95 551.508.59:551.551:629.13

Great Britain. Ministry of Supply. Civil Aircraft Research and Development Branch, **Gust research at RAE.** *Commonwealth Air Transport Council, London, Newsletter*, Nr. 39:15–18, July **1956.** 5 figs. **DLC** (TL501.C597)—Describes a counting accelerometer and a fatigue meter designed at RAE (Royal Aircraft Establishment), with which 8000 flying hours records have been collected and analyzed. A standard gust spectrum has been established to determine the safe fatigue life of an aircraft. *Subject Headings:* **1. Gustiness meters 2. Airplane instrumentation. I. Great Britain. Royal Aircraft Establishment.**—*C.E.P.B.*

9.3–96 551.551:629.13

Croom, Delwin R.; Shufflebarger, Charles C. and Huffman, Jarrett K., **An investigation of forward-located fixed spoilers and deflectors as gust alleviators on an unswept-wing model.**

U. S. National Advisory Committee for Aeronautics, Technical Note 3705, June **1956.** 26 p. 1 figs., 7 refs. **DWB, DLC**—The present paper presents the results and discussion of an investigation in the Langley 300-MPH 7- by 10-ft tunnel and the Langley gust tunnel to determine the longitudinal aerodynamic characteristics and the gust-alleviation capabilities of forward-located fixed spoilers, deflectors, or spoiler-deflector combinations on a simulated transport airplane model having an inswept wing. Analysis indicates that a forward-located fixed deflector would be a practicable and an effective alleviator of gust loads when turbulence is encountered inasmuch as it reduces the normal accelerations, aids in slow-down, and requires small attitude and trim changes. *Subject Heading:* **1. Gust-alleviation system. I. NACA TN 3705.**—*NACA abstract.*

9.3–97 551.591:629.13

*Sperry Gyroscope Co., Great Neck, N. Y., **An operational flight evaluation of an approach one slant visibility measuring system.** Contract AF 19(604)-1372, Sperry Report No. 1245-4079, May **1957.** Each section repaged. 58 figs. (incl. photos), 7 tables, 9 refs., 6 eqs.—The system for measuring the approach slant visibility under ceiling and instrument conditions worked out at MacArthur Field, L. I., has been tested under difficult operational conditions at Newark Airport between Nov. 1955 and Nov. 1956. Results of 1400 airline pilot reports are analyzed in great detail, the transmissometer-ceilometer and visual reporting system described and equipment illustrated, the terms used defined precisely and the data presented in extensive tables and charts. Slant visibility cannot be evaluated in absolute numbers, but only in probabilities. Also, the fog, smoke-haze factor which is prevalent at Newark can be considered homogeneous during the day but not at night. Numerous nomograms are presented. *Subject Headings:* **1. Slant visibility reporting 2. Transmissometer data 3. Newark Airport, N. J.**—*M.R.*

9.3–98 551.586:612.275.11

*†Whiteside, Thomas C. D. (*Inst. of Physiology, Glasgow Univ. and R.A.F. Inst. of Aviation Medicine, Farnborough, Hants*), **Problems of vision in flight at high altitude.** Published for and on behalf of The Advisory Group for Aeronautical Research and Development, NATO, by Butterworths Scientific Publications, London, **1957.** 162 p. 64 figs., 9 tables, 100 refs. (*AGARDograph*, No. 13.) **DWB** (629.1232 N864a No. 13)—After a sketch of the history of flying of all types and of aviation medicine, the book takes up problems of vision at high altitude due to radiation or sunlight (contrast between light and shadow changes in spectral distribution of sunlight); fluorescence in the lens of the eye due to UV irradiation (UV intensity at 40,000 ft is 3 times as high as at sea level); intraocular scatter of light; glare, anoxia, accomodation and relaxation and field experiments or tests under controlled conditions. Arctic white-out is discussed on p. 139–40. *Subject Headings:* **1. Aviation medicine 2. High altitude vision 3. Polar whiteout.**—*M.R.*

9.3–99 612.275.11

†***German aviation medicine, World War II.** Prepared under the auspices of the Surgeon General, U. S. Air Force [by the U.S.A.F. School of Aviation Medicine, Randolph Field, Texas.] Wash., D. C. Pub. by the Govt., pref. **1950.** 2 v. (1302 p.) figs., tables, bibliog. throughout. Price per set: $8.50. **DWB, DLC** (TL555.G445)—Important articles abstracted individually. *Subject Headings:* **1. Aviation medicine. I. U. S. School of Aviation Medicine, Randolph Field, Texas.**

9.3–100 629.13(09)

Mansfield, Harold, **Vision: a saga of the sky.** N. Y., Duell, Sloan and Pearce, **1956.** 389 p. photos. **DWB, DLC**—The history of the aviation industry is well-known, in general, to the present generation, but the details of the development of military and commercial aviation, from the World War I days to the present, cannot be grasped as easily by any other means as by means of this personalized account of the evolution of the Boeing Co. (Seattle, Wash.) and of its dozens of aircraft, the troubles which they encountered at every stage, the testing and loss of experimental aircraft and the change over from the bi-plane flying boat to

the monoplane, jet plane and finally the controlled or guided missiles. Over the weather flying came about in the mid 1930's. *Subject Headings:* **1. History of aviation 2. Popular science books 3. Boeing airplanes.**—*M.R.*

9.3–101 551.508.85:551.501.7:629.13

Bendix Aviation Corporation. Bendix Radio Div., **Airborne radar systems, type RDR-1** Bendix Aviation Corporation, Baltimore, Md., **1955.** unpaged. figs.—A pamphlet describing and illustrating the all-weather flying aid, the Bendix RDR-1 airborne radar system which allows areas of turbulence, or rather of strong rainfall intensity gradients, to be observed and avoided in flight. These areas are indicated as iso-echo lines on the PPI scope. *Subject Headings:* **1. Airborne weather radar 2. Bendix RDR-1 Weather radar.**—*M.R.*

9.3–102 551.582:629.13(5)

Cronin, Jack, **Brief summary of en route weather on the HKG/BKK/HKG and MNL/SIN/MNL routes.** Bangkok, Thailand, Pan American World Airways, Sept. **1954.** 7 p. Mimeog. **DWB** (M06.1/59 C947b)—Notes on the monthly and seasonal (monsoonal) characteristics of the weather in the S.E. Asia region and at the terminals of Bangkok, Singapore and Hong Kong and Manila and along the air routes connecting these terminals. *Subject Headings:* **1. Southeast Asia air routes 2. Airways climatic data.**—*M.R.*

AGRICULTURAL METEOROLOGY

See also: **Soil. 1957 Yearbook of Agriculture** (U. S. Dept. of Agriculture), 9.3–3; **Soil conditions and plant growth** (Joint Committee on Soil Tilth), 9.3–4.

9.3–103 551.571:633.11

Jírů, Jarmila, **Měřeni vlhkosti zrna a vlhkosti vzduchu v obilném prorstu.** [Measurement of the water content of grain and humidity of the air in standing crop.] *Meteorologické Zprávy*, Prague, 10(2):41–44, **1957.** 4 graphs, 2 tables, 2 refs., eqs. Russian and German summaries p. 41. **DWB**—Atmospheric humidity a) in an instrument shelter and b) in nearby wheat, barley and oat fields, and moisture content of grain in the same fields was measured simultaneously at the station Doksanynad Ohří during the harvest seasons 1955 and 1956. Results of the measurements are presented in comparative tables and curves. Grain moisture is found to be closely correlated with atmospheric humidity, whose diurnal variations (e.g., the minimum value) it follows with a lag of 2–3 hours. *Subject Headings:* **1. Moisture content of grain 2. Humidity measurements 3. Doksany nad Ohří, Czechoslovakia.**—*G.T.*

9.3–104 551.571.36:632.4:633.3

Hogg, W. H., **Weather and the incidence of chocolate spot on beans.** *Great Britain. National Agricultural Advisory Service, N.A.A.S. Quarterly Review*, No. 32:87–92, **1956.** fig., 2 tables, 4 refs. **DLC**—Occurrences of Chocolate Spot in S.W. England in March–July 1942–1953 were compared with numbers of hours of relative humidity $\geq 95\%$ (expressed as % of mean for month) at Bristol. In 8 years there was a close relation, in 3 years moderately close, and only in 1942 no apparent relation. *Subject Headings:* **1. Humidity effects 2. Fungus diseases 3. Beans.**—*C.E.P.B.*

9.3–105 551.5:633.1:06

Fedorova, N. P., **Nash opyt v agrometeorologicheskom obsluzhivanii vozdelyvaniia kukuruzy.** [Our experience with an agrometeorological service for corn growers.] *Meteorologiia i Gidrologiia*, No. 8:43–45, Aug. **1956. DWB, DLC**—An account of the manner in which the Privolga Ukrainian Hydrometeorological Service provided technical agrometeorological services for the cultivation of maize during 1955. These included: 1) a three month course in the agriculture meteorology of maize cultivation; 2) the working up of meteorological and phenological data such as mean and extreme soil temperatures providing mean and extreme sowing dates, productive moisture reserves, phenological data; soil temperature observations at a depth of 10 cm; 3) forecasting date of sowing about 20 days in advance; 4) continuous consultation on soil moisture reserves during vegetation period, etc. *Subject Headings:* **1. Agrometeorological services 2. Corn cultivation 3. Corn phenology 4. U.S.S.R.**—*I.L.D.*

9.3–106 551.524.37:632.111.32

Aichele, Heinz, **Erprobung von Frostschutzgeräten in Württemberg.** [Testing of frost protection apparatus at Württemberg.] *Germany. Deutscher Wetterdienst, Mitteilungen,* 3(16):62–68, **1956.** 7 figs. (incl. photos), 2 tables. **DWB**—The wine growing area of Baden Württemberg is described with special reference to the topographic conditions and the use of heating as frost prevention. With the aid of photographs the author describes the construction and use of three types of heating devices—namely, the field heater "Kontia-Frost," the oil oven and a briquette oven. Graphic and numerical data illustrating the heating effects are presented and the costs of these devices are discussed. *Subject Headings:* **1. Frost protection of vineyards 2. Vineyards 3. Württemberg, Germany.**—*I.L.D.*

9.3–107 551.524:551.525:551.579:633.15

Chirkov, IU. I., **Opredelenie progrevaniia pochvy po temperature vozdukha v period posseva i prorastaniia kukuruzy.** [The determination of soil warming by air temperature during the sowing and germination period of maize.] *Meteorologiia i Gidrologiia,* No. 6:32–34, June **1956.** 2 tables. **DWB, DLC**—An index was established between the air temperature in an instrument shelter and the soil temperature at a depth of 5 cm for clayey and sandy soils on the basis of some two years of observations. Data are presented on the mean monthly durations of the soil temperature at 5 cm from that in the instrument shelter and on the mean monthly temperature of the air and soil at 5 cm depth. The role of soil moisture in determining the deviation of soil and air temperature is analyzed. The soil temperature at 5 cm can be determined if the air temperature and moisture conditions of the soil are known. The application of this procedure to maize sowing and cultivation is considered. *Subject Headings:* **1. Air-soil temperature determination 2. Soil moisture variations 3. Corn cultivation.**—*I.L.D.*

9.3–108 551.508.71:551.509.59:632.9

Grainger, John, **How you can forecast potato blight.** *Grower,* London, 46(16):919–923, Oct. 20, **1956.** 2 figs. **DA**—Potato blight can be controlled by spraying foliage to keep it green as long as possible, to obtain maximum yield for consumption without storage, or by destroying foliage when tubers are to be stored. When blight appears early, spraying can be economic, especially when blight can be forecast. This can be done by the Auchincruive self-calculating instrument. Ability of plant to take blight depends on ratio of total carbohydrate to residual dry weight of the shoot (Cp/Rs ratio). *Subject Heading:* **1. Potato blight forecasting.**—*C.E.P.B.*

9.3–109 633.491:551.585.7

Malyshev, A. A., **Biologicheskie osobennosti kartofelia v usloviiakh vlazhnykh vysokogorii.** [Biological characteristics of the potato plant grown under conditions of damp alpine climate.] *Akademiia Nauk SSSR, Doklady,* 112(2):344–346, Jan. 11, **1957.** table. **DLC**—Owing to their slight heat requirements, potatoes can be grown in humid mountain regions at the upper limit, where plants can be cultivated. Potatoes cultivated up to heights of 3000 m in the humid high mountain regions of the northern slopes of the Western Caucasus and the north eastern Altai were investigated in regards to their vegetative period, weight of tubers, yield, disease incidence, sugar content, etc. Their various characteristics are related to air and soil temperature and atmospheric humidity. *Subject Headings:* **1. Potato cultivation 2. Humid alpine climates 3. Western Caucasus, U.S.S.R.**—*I.L.D.*

9.3–110 631.95:551.585.7

Malyshev, A. A., **Protsessy razvitiia i rosta kul'turnykh rastenii v vysokogornykh zonakh severnogo sklona Zapadnogo Kavkaza.** [Development and growth processes of cultivated plants in alpine zones of the nothern slope of the Western Caucasus.] *Akademiia Nauk SSSR, Doklady,* 112(1):152–154, Jan./Feb. **1957.** table, 5 refs. **DWB, DLC**—Experiments were carried out on the development, growth and yield of various cultivated crops such as potatoes, vegetables, grains etc. at different levels from 520 m to 3000 m on the northern slopes of the Western Caucasus Mountains. Data are presented on the temperature sums above 10°C, duration of the growth period in days and number of years of observations. The

relationship of the temperature regime at the various levels to the growth and yield of crops is analyzed. *Subject Headings:* **1. Crop ecology 2. Alpine climates 3. Crop yield 4. Western Caucasus, U.S.S.R.**—*I.L.D.*

9.3–111 551.585:63

Gol'tsberg, I. A., **Klimaticheskie opisaniia s uchetom trebovanii sel'skokhoziaĭstvennogo proizvodstva.** [Climatic descriptions which meet the requirements of agricultural production.] (In: Budyko, M. I. (*ed.*), **A. I. Voeĭkov i sovremennye problemy klimatologii.** Leningrad, **1956.** p. 253–261. 14 refs.) **DWB**—The theoretical ideas of A. I. Voeĭkov on agroclimatic classification and the establishment of agroclimatic regions has been developed by G. T. Selianikov, P. I. Koloskov, F. F. Davitaia, etc. The agroclimatic characteristics of a territory should include the thermal characteristics, moisture supply during the growing seasons of agricultural crops, watering conditions for winter and perennial crops and climatic characteristics damaging to winter crops. The greater portion of this paper is a detailed analysis of the contents of the following monograph **"Agroclimatic and water resources of the virgin and fallow lands"** ed. by F. F. Davitaia, Gidrometizdat, Leningrad 1955. *Subject Headings:* **1. Agroclimatological classification 2. Agroclimatic regions. I. Davitaia, F. F.**—*I.L.D.*

9.3–112 551.579.5:633.111

*Verigo, S. A.; Mastinskaia, S. B. and Razumova, L. A., **Vlagoobespechennost' iarovoĭ pshenitsy v raĭonakh osvoeniia tselinnykh i zalezhnykh zemel'.** [Moisture availability for spring wheat in virgin and fallow soils.] *Meteorologiia i Gidrologiia*, Leningrad, No. 5:3–8, Sept./Oct. **1955.** 3 figs., 2 tables. **DWB, DLC**—The moisture availability for spring wheat in the southeastern part of European Russia and in western Siberia is based upon data of soil moisture extending 15 to 40 years. Data, both in tables and graphs and as isolines, are presented on the dynamics of the reserve of productive moisture in soil under young wheat during the growing season, number of years with different supplies of moisture under spring wheat at the end of the month (layer of soil ranges from 0–20 cm and 0–100 cm), reserves of productive moisture in soil for different developmental stages of wheat in different zones and water availability for spring wheat sown on ploughed land of clayey soil and on fallow land of clayey soil not subject to the influence of ground water. *Subject Headings:* **1. Soil moisture availability 2. Soil moisture data 3. Wheat 4. U.S.S.R. 5. Western Siberia.**—*I.L.D.*

9.3–113 551.524.36:551.584.4:634.11

Lake, J. V., **The effect of microclimatic temperature upon the date of flowering of the apple.** *Journal of Horticultural Sciences*, London, 31(4):244–257, Oct. **1956.** 7 figs., 8 tables, 11 refs. Abstracted from reprint.—Experiments were carried out in 1954 and 1955 at Shinfield, Berks, on effect of site (high, *X*, 202 ft a.s.l. and *Y*, frost pocket, 134 ft) on growth of dwarf apple trees in pots. In spite of more favorable day temperatures, vegetative and flower buds at *Y* were checked by lower minima. Effect of siting in 1954 on flower buds in 1955 was significant. *Subject Headings:* **1. Temperature effects 2. Apple growth 3. Berkshire, Eng.**—*C.E.P.B.*

FOREST METEOROLOGY

See also: **Alpha-radioactivity distribution in forest types** (Curtis), 9.3–137; **Forest influences on runoff** (Armand), 9.3–246.

9.3–114 551.588.6

†Rubner, Konrad and Reinhold, Fritz, **Das natürliche Waldbild Europas als Grundlage für einen europäischen Waldbau.** [The natural forest pattern of Europe as a basis for a European forest development.] Hamburg, Verlag Paul Parey, **1953.** 288 p. 96 figs. (incl. photos), bibliog. p. 282–288. **DLC** (QK938.F6R75)—In the first ch. (p. 3–11) of this text on the regional distribution of forests in Europe, the climatic and soil types of Europe are delineated on the basis of K. Rubner's (1937–38) classification of the forest climates of Europe. Rainfall and advent-of-spring charts (for Europe) are also presented and the climates of each

region of Europe discussed in relation to its influence on soil or forests. *Subject Headings:* **1. Forest climates 2. Climatic zones of Europe 3. Rubner's forest-climate classification 4. Europe.**—*M.R.*

9.3–115 551.524.37:634.94

Duffield, John W. (*Industrial Forestry Assoc.*), **Damage to western Washington forests from November 1955 cold wave.** *U. S. Forest Service. Pacific Northwest Forest and Range Experiment Station, Research Note*, No. 129, June **1956.** 5 p. 3 figs., 2 tables. **DWB**—Oct. and early Nov. 1955 were unusually mild so trees were not cold-conditioned when a severe drop in temperature occurred on Nov. 11. Sunny days and cold nights, strong east and NE winds increased damage. A survey of damage to conifers in Western Washington showed open stands with southerly exposures or in scattered stands suffered the most damage. Of the 5 major conifers Western Hemlock was the most heavily damaged. Extensive killing of alder and madrona occurred (among hardwoods) and exotic species (redwood, Port Orford cedar and monterey pine) were killed outright. Maps show areas of relative amounts of damage to the 2 main evergreen species. *Subject Headings:* **1. Freezing effects on forests 2. Cold-wave, Western Washington (Nov. 1955) 3. Western Washington.**—*M.R.*

9.3–116 551.585:634.94

Goodnight, Clarence J. and Goodnight, Marie L. (*both, Purdue Univ., West Lafayette, Indiana*), **Some observations in a tropical rain forest in Chiapas, Mexico.** *Ecology*, Durham, N. C., 37(1):139–150, Jan. **1956.** 2 photos, 3 tables, 22 refs. **DWB, DLC**—This survey carried out near Palanque, Chiapas, Mexico contains daily readings of atmosphere and relative humidity recorded for July 7–July 20, 1949 taken within the forest about three-fourths of a mile from the forest edge. *Subject Headings:* **1. Tropical rain forests 2. Rain forest climate 3. Chiapas, Mexico.**—*I.L.D.*

9.3–117 551.525:634.956

*Gregory, R. A., **Effect of clearcutting and soil disturbance on temperatures near the soil surface in Southeast Alaska.** *U. S. Forest Service. Alaska Forest Research Center, Station Paper*, No. 7, Sept. **1956.** 27 p. 11 figs., 6 tables, 17 refs. **DWB** (M25 G823ef)—Air and soil temperatures were considered to be the most important climatic elements in the germination survival and growth of seedlings in SE Alaska. Air and soil temperatures were considerably increased by clearcutting. Maxima were most affected; minima least. Data were obtained during May–Sept. 1952–5 at Hollis, Alaska, on Prince of Wales Island (Lat. 55°28'N, Long. 132°41'W). *Subject Headings:* **1. Soil surface temperatures 2. Clearcutting effects on soil temperature 3. Forest seedbeds 4. Southeast Alaska.**—*M.R.*

9.3–118 551.579:551.588.6:632.7

Love, L. D., **The effect on stream flow of the killing of spruce and pine by the Engelmann spruce beetle.** *American Geophysical Union, Transactions*, 36(1):113–118, Feb. **1955.** 2 figs., table, 6 refs. **DWB, DLC.** Also: Bue, Conrad D.; Wilson, Milton T. and Peck, Eugene L.: **Discussion [on preceding article]**, *Ibid.*, 36(6):1087–1089, Dec. **1955.** 4 figs., 2 refs. **DWB, DLC**—A check on the analysis in article by Love was made by using the double mass technique for the observed runoff of the White River near Meeker, Colo., against water content of snow cover in the White River Basin, showing a straight line relationship, or no change, whereas data for the Elk River showed a break in 1946 or 1947 indicating less runoff relative to water content for 1947–51. This change affected the curve for the White River when data were extrapolated back to 1937. Thus the control river (Elk) showed a break whereas the test basin (White) which was affected by the killing of spruce did not, suggesting compensation in the latter case. Wilson and Peck show curves which suggest that a time trend may be responsible for the increase since 1946. *Subject Headings:* **1. Forest influences on runoff 2. Snow-runoff relationships 3. Spruce beetle effects on streamflow 4. White River Basin, Colo.**—*M.R.*

INDUSTRIAL METEOROLOGY

See also: **Soil freezing** (Natl. Res. Council), 9.3–2; **Radiation control, Savannah River Lab.** (Nicholas), 9.3–135; **Radioactivity in mines** (Katayama), 9.3–136; **Storm wind damage prevention** (Dodge), 9.3–204; **Building climatology** (Bider), 9.3–285.

9.3–119 551.510.41:546.3:577.39

Mel'nikova, E. A., **Materialy k obosnovaniiu dopustimogo soderzhaniia kadmiia i vanadiia v vozdukhe proizvodstvennykh pomeshcheniĭ.** [Data for the determination of the permissible concentration of cadmium and vanadium in the air of industrial premises.] *Gigiena i Sanitariia*, Moscow, 22(3):25–31, March **1957.** 4 figs., 5 refs. **DLC**—The toxic effects of dispersed aerosols of cadmium and vanadium upon the central nervous system are discussed in the light of experimental studies on white rats. The action of CdO and V_2O_5 upon chronaxie and conditonal responses where investigated and the results are presented in graphical form. The maximum permissible concentration of vanadium of 0.0001mg/liter determined in earlier studies was confirmed. But a similar concentration of cadmium is allowable temporarily only. *Subject Headings:* **1. Cadmium in air 2. Vanadium in air 3. Industrial indoor air pollution 4. Nervous system.**—*I.L.D.*

9.3–120 551.586:628.8:728:697.1(213)

*Buckens, F., **Considérations sur l'étude climatologique quantitative de l'habitation tropicale.** [Considerations on a quantitative climatological study of tropical housing.] *Belgium. Académie Royal des Sciences Coloniales, Classe des Sciences Techniques, Mémoires in 8°*, n.s., 3(2), **1955.** 144 p. 20 figs., 32 tables, 27 refs., 77 eqs. **DWB**—An experimental and theoretical study of the thermal properties of housing and of the behavior of building materials in a tropical environment from the point of view of an engineer. The discussion of the climate of Central Africa includes the application of Fourier analysis to individual climatic variables as a method of analyzing climatic periodicity. The classification of the climate according to the Köppen system, and an analysis of the diurnal and annual variations of solar radiation, temperature, relative humidity and vapor pressure and wind speed and directions based upon data of Leopoldville, Lwiro (Kivu), etc. The principal portion of this monograph is the experimental and theoretical analysis of thermal regime of houses including actual experimental data and their interpretation and the thermal characteristics of the constituents of houses, such as the thermal parameters of the walls and of various building materials. A detailed theoretical and experimental analysis of the thermal characteristics of a house at Ruanda is presented. *Subject Headings:* **1. Tropical housing 2. Thermal properties of building materials 3. Climatic studies 4. Belgian Congo.**—*I.L.D.*

9.3–121 551.584.6:629.123.4

Höller, E., **Schadensfälle und ihre meteorologische Deutung.** [Cases of damage and their meteorological interpretation.] *Hamburg. Seewetteramt, Einzelveröffentlichungen*, No. 9:6–12, **1956.** 4 figs. **DWB**—Several cases are described in which serious damage occurred to cargo loaded in cold and delivered in hot temperature or vice versa. Most of the damage could have been prevented by ventilation at the right time. For a proper planning of ventilation, conditions of the cargo, ships' hold and environment have to be known. Sample air and sea temperature conditions of sea routes through the tropics and comparative precipitation values for Hamburg and French West Africa are presented. *Subject Headings:* **1. Cargo ventilation 2. Cargo damage 3. Ships' hold climates.**—*G.T.*

9.3–122 620.197:551.571

Görling, P., **Klimabedingte Korrosion in Packungen.** [Corrosion in packages due to climatic factors.] *Hamburg. Seewetteramt, Einzelveröffentlichungen*, No. 9:39–40, **1956. DWB**—A qualitative discussion of condensation processes in airtight packages containing metal objects. It is shown how water vapor contained in the air inside the package and in hygroscopic wrappings will condense on the metal parts when certain critical values (75% of saturation vapor pressure, for steel) are reached due to temperature changes. *Subject Headings:* **1. Corrosion of metal in packages 2. Condensation in packages.**—*G.T.*

9.3–123 629.123.5:620.19

Determann, H., **Der Schutz technischer Exportgüter durch geeignete Verpackungsmethoden.** [Protection of exported technical equipment by suitable methods of packaging.] *Hamburg. Seewetteramt, Einzelveröffentlichungen*, No. 9:34–39, **1956.** 6 figs. **DWB**—Results of corrosion experiments with tight metal foil packages using moisture-absorbent silica gel and other protective material. Humidity inside the package and amount of protective material to be used depends on ambient weather conditions. *Subject Headings:* **1. Cargo protection 2. Corrosion 3. Packaging methods.**—*G.T.*

9.3–124 551.584.6:629.123.4

Bullig, H.-J., **Zur Entstehung eines Laderaumklimas, von Laderaum- und Ladungsschweiss.** [Formation of ships' hold climate, sweating of holds and cargo.] *Hamburg. Seewetteramt, Einzelveröffentlichungen*, No. 9:12–21, **1956.** 5 figs. **DWB**—Physical conditions of condensation in ships' holds and their applications to trips from cold into tropical climates and vice versa are explained. Climatological danger zones are discussed and shown on a world map; measures to be taken in such zones are indicated. The effects of the type of cargo on the occurrence of condensation in ships' holds are considered. Temperature and humidity conditions necessitating ventilation are shown in diagrams for cotton and wood. *Subject Headings:* **1. Ships' hold climates 2. Cargo ventilation.**—*G.T.*

9.3–125 551.584.6:629.123.4

*Baumbach, S., **Betrachtungen über Temperatur-, Feuchte- und Belüftungsmessungen in Laderaum.** [Measurement of temperature, humidity and ventilation in ships' holds.] *Hamburg, Seewetteramt, Einzelveröffentlichungen*, No. 9:22–29, **1956.** 8 figs., 2 refs. **DWB**—A trip was arranged to West Africa in summer 1955 with the following objectives: a) simultaneous and continuous measurement of various elements of the climates in and outside the ship's hold, b) analysis of the effect of the ambient conditions upon the indoor climate and the effect of different indoor conditions upon various cargos. The instrumental installation and the techniques used are described. The elements measured included water and air temperature, humidity, precipitation, amount of ventilation and wind. Data are presented graphically, showing correlation between various elements. *Subject Headings:* **1. Ships' hold climates 2. Cargo ventilation.**—*G.T.*

MEDICAL METEOROLOGY

See also: **High altitude vision** (Whiteside), 9.3–98; **German aviation medicine,** 9.3–99; **Determination of permissible concentration of cadmium** (Mel'nikova), 9.3–119; **Allergen content of air** (Gurney, Cryst), 9.3–167; **Comfort climate** (Woolrich), 9.3–271; **Caloric intake-energy expenditure relationships** (Buskirk et al.), 9.3–273.

9.3–126 551.510.42

McCaldin, Roy O.; Kenline, Paul A. and Wiggin, David C., **Air pollution in Connecticut: Report of a cooperative survey by the U. S. Public Health Service and the Connecticut State Dept. of Health, April–Sept. 1956.** Cincinnati, Ohio, Robert A. Taft Sanitary Engineering Center, **1957.** 111 p. 26 figs., 28 tables.—A monographic survey report on all aspects of the air pollution problem in Connecticut. Industrial and population, labor and pollution sources data are presented and analyzed in many ways. The influence of climate and relief are also considered. Monthly wind rose charts show data for 3 stations in Connecticut and 3 in bordering states. Other charts show average annual temp. and precip. respectively. Local climatic influences are discussed with respect to each town. *Subject Headings:* **1. Atmospheric pollution surveys 2. Connecticut. I. Connecticut. Dept. of Health II. U. S. Public Health Service.**—*M.R.*

9.3–127 551.586:615.834

Chubukov, L. A., **Klimaticheskie kurorty SSSR.** [Resort climates in the USSR.] *Priroda*, 45(8):22–32, **1956.** figs., map, table. **DLC**—The climates of the USSR are divided into the climatic regions established by L. S. Berg (shown on a map). The climatic character-

istics of various areas such as mountain, desert, seashore, etc. described. The various climat health resorts of the USSR are classified into lowland forest resorts, lowland-steppe resort lowland desert resorts, foothills, resorts of Mediterranean climate, humid subtropical resort and mountain resorts. Weather type graphs (Federov-Chubukov classification) of the variou climatic types are presented. *Subject Headings:* **1. Resort climatology 2. Health resort 3. U.S.S.R.**—*I.L.D.*

9.3–128 551.577:313.62

*Magnuson, M. D. (*Northwest Area Climatologist, U. S. W. B., Seattle, Wash.*), **Relationshi between precipitation and traffic accidents in Seattle, Wash.** *U. S. Weather Bureau, Weekl Weather and Crop Bulletin*, 44(16):7–8, April 22, **1957.** 4 figs., 4 refs. **DWB**—Compariso of hourly traffic accident incidence for 3 years in Seattle, Wash., during Oct.–Dec. on dry days days with light rain (<0.001″ per hour), moderate or heavy rain (>0.01″ per hour), and with snow shows a marked increase in accidents at all hours, with the worsening of the weather Graph's show hourly curves for each type of weather for week days, for week ends, and for typical snowy day, a typical rainy day and a dry day. Data were prepared by Dan Julian of the Traffic Engineers Office of Seattle, and Carolyn M. Arwine, Statistical Unit of Seattl Police Dept. *Subject Headings:* **1. Precipitation-traffic accident relationships 2. Traffi accident data 3 Seattle, Wash**—*M.R.*

9.3–129 551.508.91:57

Reifferscheid, H. (*Munich*), **Prüfung der Wirksamkeit von Luftdesinfektionsmitteln mi Hilfe von konimetrischen Keimgehaltsbestimmungen.** [Testing the effectivity of air dis infectants by means of konimetric nuclei-content determination.] *Wetter und Leben*, Vienna 7(8/11):282–283, **1955. DLC**—The author describes the experimental test of a "biologica konimeter" to determine quantitatively the germ concentration in the air of a room. The infection of an experimental room with spores and molds is described and the regime of the germs concentration is discussed. Successive measurements with a konimeter yield an estimate of the effectiveness of the disinfections after the normal decline in germ content is exhibited *Subject Headings:* **1. Microbe counters 2. Konimeters 3. Aerobiology.**—*I.L.D.*

9.3–130 551.510.42:546.22:616.2

Arkhipov, A. S., **Gigienicheskoe znachenie zagriazneniia atmosfery zavodskikh ploshch adok khimicheskikh proizvodstv.** [Hygienic significance of pollution of the atmosphere in emical plants.] *Gigiena i Sanitariia*, Moscow, 22(2):22–31, Feb. **1957.** 4 tables, fig., refs. English summary p. 31. **DLC**—The author carried out three series of experiments in which guinea pigs were subjected to sulfuric acid aerosols in concentrations of 2.4 and 6 mg/m³ for five days. Histological examination of the lungs and the upper respiratory tracts of all the experimental animals revealed lesions similar to those of an acute interstitial process caused by disturbances in the blood or lymph circulation. In the early period following the actions of the sulfuric acid aerosol, edema of the lungs developed. In the later period infiltrations around the vessels and bronchi and sclerotic changes around the vessels were found. *Subject Headings:* **1. Atmospheric pollution effects 2. Sulfuric acid aerosols 3. Respiratory diseases.** —*I.L.D.* [Based on Author's abstract.]

9.3–131 551.556:616.2

Itskova, A. I., **K obosnovaniiu gigienicheskikh normativov vetrozashchitnykh mero priiatii.** [Establishment of hygienic standard for wind protection measures.] *Gigiena i Sanitariia*, Moscow, 21(9):11–18, Sept. **1956.** 3 figs., 2 tables, 7 refs. **DLC**—The effect of wind velocity under low temperature upon breathing of human beings under natural and experimental conditions such as wind velocity 6.5 m/sec with −28°C and 5, 10, 25 m/sec with the same temperatures is given. Data are presented on the change in pulmonary ventilation with different wind velocities, the change in oxygen requirement and skin temperature under wind action, etc. Action of the wind is analyzed on the basis of its mechanical effect, that is effect on breathing and its chilling effect. *Subject Headings:* **1. Wind effects on breathing 2. Wind velocity.**—*I.L.D.*

9.3–132 551.586:612.014.4

*Brazol, Demetrio, **Escala bioclimática universal.** [Universal bioclimatic scale.] *Circulo Aeronáutica, Buenos Aires, Colección Aeronautica Argentina*, Anexo to Vol. 40, **1955.** 66 p. ;s., tables. **DWB** (M86 B827e)—Climates of various cities throughout the earth are classified cording to a 12 point scale which ranges from intense "glacial" cold through cold, fresh, mfortable, hot . . . , intensely hot to suffocatingly hot. The scale is based on 5° or 10° tervals of "equivalent temperature" (TE) ranging from −10° to +80°. Annual range of E for each of 12 South American "Capitals" and as many European and North American apitals" are shown by means of histograms relative to this scale. Quito and Bogota are own to be always in the comfortable zone; Santiago, Montevideo, Buenos Aires, Sydney, sbon, Madrid, and Capetown mostly in the comfortable zone, and Georgetown and Colón ways in the intensely hot zone. The fact that seasonal differences exist is recognized in the bulations on p. 21–66 of places and months when these places fall into the various categories. he basis of the scheme is thoroughly expounded and illustrated. *Subject Headings:* **1. Bioimatic classification 2. Comfort zones 3. South America.**—*M.R.*

9.3–133 551.555.3:612

Lauscher, Friedrich (*Vienna*), **Gibt es bioklimatisch kalten Föhn?** [Is there a bioimatically cold föhn?] *Wetter und Leben*, Vienna, 8(8/11):168–173, **1956.** 3 tables, ref. **LC**—The occurrence of high wind velocities during föhn can exert a cooling effect upon uman temperature and the biological föhn effect may be the consequence of alternate cooling nd warming of the body. Using HILL's cooling power formula, the author analyzes the egree of cooling occurring during föhn at Innsbruck when varying wind velocities are taken to account. *Subject Headings:* **1. Föhn effects 2. Cooling power 3. Wind velocity 4. Innsuck, Austria.**—*I.L.D.*

RADIOACTIVITY

See also: **Radioactivity of sea water** (Model), 9.3–74; special bibliog. on **Radioactivity in atmos.**, p. 324.

9.3–134 551.510.42:551.510.7

Parliament to get report on increase in radioactivity. *News of Norway*, N. Y., 18(36):143, ct. 18, **1956.**—Radioactive fallout measured in Norway was ten times higher (reaching $\frac{1}{10}$ of ghest permissible radiation) in Sept. 1956 than in preceding months. The increase is tributed to nuclear tests, mainly those in the Soviet Union. Cessation of nuclear tests urged. *Subject Headings:* **1. Radioactive fallout 2. Norway.**—*G.T.*

9.3–135 551.510.7:662.2:539.16 739.752

Nichols, Gordon M. (*Lab. Serv. Div.*), **Radiation control at the Savannah River Laboratory.** . I. du Pont de Nemours & Co., Contract AT (07-2)-1, Report DP-186, Nov. **1956.** 15 p. g., table. **DWB** (539.752 N618r)—Report discusses "containment" philosophy of control of adiation to minimize hazards, methods of monitoring of personnel air sampling and surveys connection with disposal of radioactive wastes. *Subject Headings:* **1. Atmospheric pollution Radioactive waste disposal.**—*M.R.*

9.3–136 551.510.7:622

Katayama, Nobuo (*Tokyo, Univ. Inst. of Earth Science, College of General Ed.*), **Betadioactivity of air in galleries.** *Tokyo. University. College of General Education, Scientific apers*, 5(2):171–177, Dec. **1955.** 3 figs., 3 tables, 3 foot-refs., eqs. **DWB**—In measuring β tivity in rock formations such as mines, the β activity of the dead air must be subtracted om the counts obtained, since the radon in the air accumulates unless air drainage is good. trong radioactivity was diagnosed in the air of the Kyūranji galley in the Okayama Prefecture nd in a drift of the Ogamo mine in the Tottori Prefecture. The corrected counts will be uite inaccurate if the β count for the air is high compared with that of the rocks, and quite ccurate if the rocks are highly radioactive. Methods are described. *Subject Headings:* . **Radioactivity in mines 2. Okayama Prefecture, Japan.**—*M.R.*

9.3–137 551.510.7:634.

Curtis, John T. and Dix, Ralph (*Botany Dept. Univ. of Wisconsin*), **Distribution of alph radioactivity in certain forest types.** *Science*, Wash., D. C., 123(3201):799–800, May 4, 195 2 tables, 5 refs. **DLC**—Data on natural radioactivity in soil, hardwood and deciduous tre in Wisconsin and the southern Appalachians are tabulated and discussed. A difference noted between several species of evergreens. *Subject Headings:* **1. Radioactivity in fores 2. Wisconsin 3. Appalachians.**—*M.R.*

9.3–138 662.2:539

Chtumov, K. V., **Gidrodinamicheskaia model' atomnogo vzryva.** [Hydrodynamic mod of an atomic blast.] *Priroda*, Moscow, 46(1):115–116, Jan. **1957.** fig. **DWB, DLC**—In model experiment a drop of a heavier liquid (glycerine) was released into a lighter liqu (water) with increasing density (addition of glycerine). The resulting picture is similar to reversed process of an atomic explosion, where lighter gases rise in turbulent form towar layer with less density. *Subject Headings:* **1. Atomic explosion models 2. Hydrodynam model tests.**—*A.A.*

METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

METHODS OF OBSERVATION

See also: **Radar storm detection** (Ligda et al.), 9.3–16; **IGY, 1957/1958, met. programme** (WMO), 9.3–26; **Antarctic weather stations** (Burkhanov), 9.3–45; **Airborne radar systems** (Bendix), 9.3–101; **Rocket-grenade experiment** (Mich. Univ.), 9.3–155; **Mixing ratio conditions** (Steinhauser), 9.3–208; **Drop impingement measurement** (Brun et al.), 9.3–230; **Soil moisture measurement** (Konček), 9.3–255.

9.3–139 551.501:551.57

Alexander, G. N., **Some aspects of time series in hydrology.** *Institution of Engineer (of) Australia, Sydney, Journal*, 26(9):188–198, Sept. **1954.** 7 figs., 31 refs., eqs. Include discussion by G. S. Watson and reply by author. **DLC**—Time series, frequency distributions spatial correlation, graphical methods, analysis of data, smoothing, residual and double mas curves, homogeneity tests, randomness or stochastic independence, recurrence intervals correlation of time series, etc. applied to rainfall, or storm studies, illustrated by example from Victorian storms, Melbourne rainfall (1856–1952) etc. are discussed and illustrated The improvement in the 3-day area-depth curves by using all rainfall records as compare with telegraphic stations only is apparent from curves for 13 Victorian storms (1893–1951) *Subject Headings:* **1. Time series in hydrometeorology 2. Statistical methods in hydro meteorology 3. Hydrometeorological studies 4. Victoria, Australia.**—*M.R.*

9.3–140 551.501.3:551.55

Dady, Guy, **Étude photo-oscillographique de la composante horizontale du vent.** [Photo oscillographic study of the horizontal wind component.] *Académie des Sciences, Paris Comptes Rendus*, 238(3):371–373, Jan. 18, **1954.** 5 refs. **DWB**—Photographic result appear directly in polar coordination showing the instantaneous horizontal vector of wind Well applicable for turbulence studies. *Subject Headings:* **1. Turbulence recording 2. Hori zontal wind components.**—*A.A.*

9.3–141 551.501.3:551.55

Zakazno, N. P., **Novyĭ metod izmereniia vozdushnogo potoka.** [A new method o measuring air flow.] *Meteorologiia i Gidrologiia*, Leningrad, No. 6:53–54, Nov./Dec. **1955** 3 figs., eq. **DWB, DLC**—The method of measuring velocity in the direction of air flow involve the use of a forced system of rotation. If a small flag is rotating with a constant angula velocity ω then the moment necessary for rotating the flag will be altered, depending upon it position relative to an air current moving with velocity ω. A formula is developed showin that the force of resistance, acting upon the flag from the windward side is a function of th velocity of the current ω and of the angle of rotation of the flag a. The type of flag for obtainin

large moment of resistance and the curve produced by a recorder of the change of force are scussed with the aid of diagrams. *Subject Headings:* **1. Air flow measurement 2. Wind locity.**—*I.L.D.*

9.3–142 551.501.4:551.508.72:551.573

*†Konstantinov, A. R., **Sopostavlenie razlichnykh metodov opredeleniia isspareniia.** [Comarison of different methods of determining evaporation.] *Leningrad. Gosudarstvennyĭ idrologicheskiĭ Institut, Trudy,* 45(99):95–120, **1954.** 4 figs., 13 tables, 19 refs. **DLC** GB651.L38)—Results obtained with the aid of evaporimeters (gravimeteric and hydraulic) e compared with results of evaporation determinations obtained by other methods such the water balance of active moisture exchange in soil layers, the heat balance of the soil's rface, and the diffusion method. At the end of the paper, the author discusses the comurative merits of various methods of determining evaporation from the soil. *Subject Headings:* **Evaporation measurement comparisons 2. Evaporimeters 3. Evaporation measurement.** *-A.M.P.*

9.3–143 551.501.4:551.573

Laĭkhtman, D. L. and Timofeev, M. P., **O metodike rascheta ispareniia s poverkhnosti granichennykh vodoemov.** [Method of calculating evaporation from the surface of bounded odies of water.] *Meteorologiia i Gidrologiia,* No. 4:19–23, April **1956.** fig., table, 6 refs., eqs. **DWB, DLC**—A bounded surface of water is considered to be of the order of magnitude -100 km²; evaporation from such a body varies with distance from the periphery and is not mplicated by condensation. A formula for calculating evaporation from a bounded water rface is developed:

$$E = E_0 + be^{-mt}[(T_0 - T')_0 + \int_0^+ ne^{mv}dy],$$

here

$$E = \frac{0.1\ S_{\mu_2} D}{x_{0.1}}; \quad b = \frac{0.K_{\mu_2} d(T')}{x_{0.1}}.$$

graph showing the annual variation of evaporation from the Tsimlyansk reservoir is preented. *Subject Headings:* **1. Evaporation calculation 2. Evaporation from reservoirs Tsimlyansk, U.S.S.R.**—*I.L.D.*

9.3–144 551.501.4:551.573

Uhlig, Siegfried, **Berechnung monatlicher Mittelwerte der Gebietsverdunstung nach iner Methode von Kalweit.** [Calculation of the monthly means of areal evaporation accordg to the Kalweit method.] *Germany. Deutscher Wetterdienst, Mitteilungen,* 15(3):**1956.** p. 7 figs., 15 tables, 15 refs. **DWB**—The author discusses the concepts of latent, potential id actual evaporation and critically analyzes the equations of Kalweit for calculating monthly eans of areal evaporation, using monthly means of saturation deficit, monthly total precipitaon, monthly total runoff and monthly mean of useable water storage for North Germany. hese equations also include variables taking into account topographic features and a term r reducing potential to actual evaporation. Tables containing for the various stations, the onthly values of the individual terms of the equations, the values of topographic factors, e calculated actual and potential evaporation, etc. are presented. It was found that the sults of the evaporation calculations are unsatisfactory, since the term for deducing potential tual evaporation depends solely upon mean annual precipitation so that there is no justificaon for including the factors for runoff and soil moisture supply in the expression for the duction term. *Subject Headings:* **1. Evaporation calculations 2. Areal evaporation 3. Kaleit method 4. N. Germany.**—*I.L.D.*

9.3–145 551.501.8:551.577.37

*Illinois. State Water Survey. Meteorologic Laboratory at Univ. of Illinois, **Study of tensity of surface precipitation using radar instrumentation.** Contract DA-36-039-Sc-64723, oject DA-3-99-07-022, 2d Quarterly Technical Report, Oct. 1–Dec. 31, **1955.** 23 p. 2 figs.,

6 tables, 4 refs. **DWB**—Hail was identified on radar in only half of the cases when it occurred. Work included studies of CPS-9 and TPS-10 radar for measuring precipitation intensity, area, synoptic conditions, drop size, ghost echoes, hail, with calibration of results against 11 first-order W. B. stations and 135 recording raingage stations in Ill. and Ind., etc. It was found that cores of precipitation do not coincide (on 3 cm radar) with raingage network cases, and 10 cm radar is recommended. (For Pt. 1, *see* 9.2–145, Feb. 1958, *MAB*.) *Subject Headings:* **1. Radar precipitation intensity measurement 2. Radar-raingage comparison 3. Radar hail studies 4. Illinois. I. Jones, D. M. A. II. Semonin, R. III. Schuetz, J. IV. Spock, M., Jr. V. U. S. Signal Corps Engineering Labs.**—*M.R.*

OBSERVATIONAL DATA

See also: **Great Plains Turbulence Field Program** (Lettau, Davidson, *eds.*), 9.3–1; **Micromet. data** (Laĭkhtman, Aĭzenshtat, *eds.*), 9.3–15; **Climatic data, Japan** (Japan. Met. Agency), 9.3–19; **Precip. data, Feather River** (Calif. Div. of Water Resources), 9.3–20; **Data from drifting station, Arctic** (Somov, *ed.*), 9.3–22; **Narrative of second Defence Res. Board Expedition** (Manning), 9.3–42.

9.3–146 551.506:551.576.11

*Antal, Emánuel and Péczely, György, **Adalékok Magyarország makroszinoptikus helyzeteinek felhőzet viszonyaihoz.** [Cloudiness conditions associated with various large-scale synoptic situations in Hungary.] *Időjárás*, Budapest, 60(5):277–286, Sept./Oct. 1956. 6 tables, 2 refs. English summary p. 277. Complete German translation p. X–XVIII. **DLC**—Average amounts of cloudiness associated with each of 15 large-scale synoptic types is tabulated for Budapest for each month of the year (50 years of observation). Probabilities of various cloud types (11 types) are also given on the basis of 10 years of observation. *Subject Headings:* **1. Cloudiness data 2. Cloud types 3. Long period records 4. Budapest, Hungary**—*G.T.*

9.3–147 551.506.1:551.58(94)

*Australia. Bureau of Meteorology, **Monthly Climatological Bulletin.** Latest issue seen: May **1957.** Issued Melbourne. Each section repaged. Numerous tables. At head of t-p: **Meteorological summary.** Title varies: 1941 (?)–June (?), 1955 as **Meteorological summary for selected climatological stations, Australia.** (*See* 4D–153, April 1953, *MAB*); July (?) 1955–Dec. 1956 as **Monthly Climatological Record. DWB** (1942–1947; 1953–date); **DA** (1948–1953)—This monthly bulletin is reproduced in a neat and permanent form and contains detailed analyses of weather conditions and summaries of noteworthy events, normal conditions (for the following months) and a review of the effects of the weather on the basic industries of each territory or province, in addition to the ordinary data summaries for each province and for the Commonwealth as a whole. *Subject Headings:* **1. Monthly climatic summaries 2. Crop bulletins 3. Agrometeorological summaries 4. Australia.**—*M.R.*

9.3–148 551.506.1(46)

*Barcelona. Observatorio Fabra. Seccion Meteorologica y Sismica, **Boletin,** No. 42, pub. **1955.** [Contains data for 1953.] 84 p. mostly tables. (For abstract on 1950 data, *see* 4.3–38 March 1953, *MAB*.) **DWB**—Daily values of air temp., precip., wind direction and speed, relative humidity, pressure, evaporation, visibility and clouds are tabulated by months and summarized for the month, and year. Observations of temperature, wind and relative humidity are given for observations at 4, 8, 12, 16 and 20 h; and for visibility and clouds for 8 h only. Special phenomena and hydrometeors are also tabulated. An annual summary, giving extreme, mean and normal values of all of the elements, by month and for year, is included. The annual summary was prepared by M. Alvarez Castillon y Bustelo; and the special phenomena, cloud and visibility data compiled by G. Campo-Cunchillos. *Subject Headings:* **1. Annual meteorological data summaries 2. Observational data 3. Barcelona, Spain. I. Alvarez Castillon y Bustelo, Manuel II. Campo Cunchillos, G.**—*M.R.*

9.3–149 551.506.1:551.578.48(494)

*Davos, Switzerland. Eidgenössisches Institut fur Schnee- und Lawinenforschung, **chnee und Lawinen in den Schweizeralpen Winter 1953/1954.** [Snow and avalanches in the viss Alps, winter of 1953/1954.] Its *Schnee und Lawinen im Winter, Winterberichte*, No. 18, 955. 128 p. 64 figs. (incl. photos), 56 tables. **DLC**—Following the usual pattern of annual port on snow, avalanches, weather and research activities in the Swiss Alps, this excellent ublication is full of statistics, charts, profiles, graphs, photographs and verbal analysis of the ear's records of snow and associated weather elements, forecasts, mortality and damage. ection A, **Meteorologie,** by Th. Zingg (p. 5–27) discusses the winter weather, the separate ements, and the conditions during the catastrophic avalanche of Jan. 10-12, 1954. Sec. B . 28–64) gives the snow depth records for Swiss Alps. Sec. C (p. 65–106), the avalanche mage in the country and 8 separate Cantons and Sec. D, the Austrian damage. Sec. E scusses special snow and avalanche research in the Parsen area by H. R. In der Gand and c. F other work of the institute. *Subject Headings:* **1. Snow data 2. Avalanche data Annual snow and avalanche reports 4. Swiss Alps. I. Zingg, Th. II. Schild, M. III. In r Gand, H. R.**—*M.R.*

9.3–150 551.506.7(73)

*Burley, Marvin W.; Ritchie, Earl M. and Gray, Charles R. (*all, Nat. Wea. Records Cen., V. S. W. B., Asheville, N. C.*), **Winds of the upper troposphere and lower stratosphere over the nited States.** *Monthly Weather Review*, Wash., D. C., 85(1):11–17, Jan. **1957.** 8+ figs., refs. **DWB, DLC**—Daily wind data from United States stations for six pressure surfaces 00, 150, 100, 80, 50, 30 mb) for the period April 1951 through January 1956 are used to udy upper winds along the 80th and 120th meridians. At 5-degree intervals along the two eridians, mid-season average wind speeds and prevailing directions have been computed nd are compared. *Subject Headings:* **1. Upper air wind data 2. United States.**—*Authors' bstract.*

INSTRUMENT CARRIERS

See also: **Satellite !** (Bergaust), 9.3–79; **Satellites** (Jensen), 9.3–80; **Effect of earth's oblateness and atmos.** (de Nike), 9.3–81; **Satellite tracking** (Merrill), 9.3–82; **Study of fine structure and irregularities of ionosphere** (Pfister), 9.3–83; **Measuring earth's magnetic field** (Singer), 9.3–84; **Determ. of air density** (Spitzer), 9.3–85; **Visibility from satellite at high altitude** (Stakutis), 9.3–86; **Study of arrival of auroral radiations** (Van Allen), 9.3–87; **Cosmic-ray observations in earth satellites** (Van Allen), 9.3–88; **Exploring atmos. with satellite-borne magnetometer** (Vestine), 9.3–89; **Experiments for measuring temp.** (La Gow), 9.3–90.

9.3–151 551.507.362

Dorling, E. B. (*Royal Aircraft Est., Farnborough, England*), **British high altitude rocket esearch program.** *Jet Propulsion*, N. Y., 27(3):289, 295, March **1957. DLC**—A high altitude ocket is being developed in the U.K. by the Ministry of Supply for a joint research program etween the Royal Aircraft Establishment and a number of universities. The vehicle is 5 ft long, 17½ in. in diam. and employs a solid propellant motor. When launched near the ertical, it is expected that an altitude of 490,000 ft will be achieved with a payload of 65 lb. ater flights with a boost addition are hoped to reach 700,000-ft altitude. The missile is abilized by three fins but it is not guided during flight and will carry telemetry, doppler, nd beacon tracking equipment in addition to the payload. The first trainable launcher has ready been installed at the Australian rocket range at Woomera and firings will begin there rly in 1957. *Subject Headings:* **1. Rocket research 2. United Kingdom.**—*Author's abstract.*

9.3–152 551.507.362

House, W. C.; Dodge, C. H.; Waldo, R. D. et al., **Future sounding rockets.** *Jet Propul-on*, N. Y., 27(3):269–273, March **1957.** 6 figs., 4 tables. **DLC**—Economic considerations, hich have been of great importance in the past, will continue to be the underlying philosophy the design of future sounding rockets. Increased summit altitudes and reliability, ease of rvicing and mobility of launch, as well as low unit cost, are used as criteria to evolve a group

of suitable sounding rockets. The Aerobee has potential capability of a 250-mi summ altitude with launching mobility and facilitated servicing. An advance vehicle similar to th Aerobee employs four thrust chambers in a unique application to extend the summit altitud above 300 miles. A vehicle known as the Spaerobee simply adds a second stage to the Aerob to give a summit altitude capability of 350 mi with a 40-lb payload. Extreme launchin flexibility can be achieved by firing a sounding rocket from an airplane which has zoomc into a vertical attitude. The single-stage Aerosound propels a 40-lb payload to 45 mi, whi a two-stage Aerosound reaches over 100 mi with the same payload. Using presently availabl solid propellant rockets, staged vehicles can be assembled yielding almost any desired perform ance. While takeoff gross weight may be relatively high, unit costs are strikingly low. *Subje Headings:* **1. Rocket propulsion 2. Rocket development 3. Rocket economic desig I. Schaff, A., Jr. II. Fuller, J. L. III. Demuth, O. J.**—*Authors' abstract.*

9.3–153 551.507.36

Itokawa, Hideo (*Tokyo Univ.*), **The Japanese sounding rockets.** *Jet Propulsion*, N. Y 27(3):286–288, March **1957. DLC**—The Japanese Science Council has two projects for th International Geophysical Year 1957–1958 Sounding Rockets Program; namely, Kappa an Sigma Projects. The objective of the Kappa Project is to make a multistaged, solid propellan ground launched rocket capable of climbing to 80 mi altitude with a payload of 15 lb. Th Sigma project aims to develop a Rockoon system with a small rocket of about 25-lb weigh and a peak altitude of between 55 and 65 mi. Progress achieved so far is described in th paper. *Subject Headings:* **1. Rocket research 2. Rockoons 3. Japan.**—*From author abstract.*

9.3–154 551.507.36

Jones, Leslie M.; Hansen, William H.; Spencer, Nelson W.; Stroud, William G. an Berning, Warren W., **The Nike-Cajun sounding rocket.** *Jet Propulsion*, N. Y., 27(3):266–268 March **1957.** 9 figs. **DLC**—The Nike-Cajun all solid propellant sounding rocket is a two stage combination, using the Nike booster as first stage and the Cajun as the instrument carrying second stage. When fired at 85° launching angle and with a 15-sec coast betwee stages, it has carried 50 lb to 100 mi altitude. Successful flights at Wallop Island, Whit Sands, Fort Churchill, and aboard ship have demonstrated that it is a simple and reliabl sounding vehicle. It will be used during the IGY at Fort Churchill and at Guam. Abou 50 Nike-Cajuns will be instrumented to measure water-vapor distribution, the earth's magneti field, cloud structure, density, winds, cosmic rays, and auroral particles. *Subject Headings* **1. Nike-Cajun rockets 2. Rocket instrumentation.**—*Authors' abstract.*

9.3–155 551.507.362:551.501.

Michigan. Univ. Engineering Research Institute, **Rocket-grenade experiment for uppe atmosphere temperature and winds.** Contract DA-36-039-SC-64659, Project DA-3-17-02-001 Project SC 1052A, Quarterly Reports, Nos. 1–3, May 1–July 31; Aug. 1–Oct. 31, 1955; Nov. 1 1955-Jan. 1, 1956. issued Aug. 15, Nov. 15, **1955** and Feb. 15, **1956.** 3 pieces. about 7 to 1 p. each. **DWB** (M07.362 M624r)—Reports cover a project whose purpose was to adap rocket-grenades for use in the Arctic during IGY and to investigate other problems of uppe atmosphere research. The rocket grenade experiment was developed by the U. S. Signa Corps and successfully tested at White Sands Proving Ground. The test conducted in th present series was carried out at Camp Edwards, Cape Cod, Mass., on Dec. 6–8, 1955. Th grenades were ejected ahead of the rocket at about 90,000 ft and detonated within 10–15 f of the rocket. Theory, development, sound ranging equipment (microbarographs and ho wire microphone) DOVAP trajectory calculations, etc. outlined and illustrated. *Subje Headings:* **1. Rocket-grenade experiments 2. Microbarograph sound ranging. I. Jones L. M. II. Bartman, F. L.**—*M.R.*

INSTRUMENTS

See also: **Gust research at RAE** (Gt. Brit. Min. of Supply), 9.3–95; **Airborne radar systems** (Bendix), 9.3–101; **Forecasting potato blight** (Brainger), 9.3–108; **Testing effectivity of air disinfectants** (Reifferscheid), 9.3–129; **Radiation instrument correction** (Lugovskaia, Pokrovskaia), 9.3–183; **High-altitude wind measurements** (Anderson), 9.3–207; **Dew measurement** (Weger), 9.3–216.

9.3–156 551.508.71:551.571

†Gol'tsman, M. I., **Sovremennoe sostoianie metodiki izmereniia vlazhnosti vozdukha.** [Contemporary methods of measuring atmospheric humidity.] *Meteorologiia i Gidrologiia*, Leningrad, No. 3:55–59, March **1956.** 45 refs. **DWB, DLC**—The author reviews a number of studies on the measurement of relative humidity published recently. These include papers on the hair hygrometer, the aspirated psychometer, the electric hygrometer, the dew point method and the method of spectral absorptions. An extensive bibliography is appended. *Subject Headings:* **1. Relative humidity measurement 2. Humidity instruments.**—*I.L.D.*

9.3–157 551.508.72:551.573

*†Konstantinov, A. R. and Struzer, L. R., **Izmerenie summarnogo isparenіia i transpiratsii sel'skokhoziaĭstvennykh kul'tur s pomoshch'iu ispariteleĭ.** [Measurement of total evaporation and transpiration from crops by means of evaporimeters.] *Leningrad. Gosudarstvennyĭ Gidrologicheskiĭ Institut, Trudy*, 45(99):66–94, **1954.** 5 figs., 24 tables, 27 refs. **DLC** (GB651.L38)—The authors discuss the results of experimentation in the use of evaporimeters for measuring evaporation from crops, and describe methods enabling one to determine separately the transpiration of plants and the evaporation from the soil. For the zone of deficient moisture, there is presented a systematic comparison of evaporation values measured with evaporimeters, and evaporation obtained by the method of water balance in the soil layer of active moisture exchange. *Subject Headings:* **1. Evaporation measurement 2. Evaporimeters 3. Transpiration.**—*A.M.P.*

9.3–158 551.508.72:551.573

†McIlroy, I. C. (*C.S.I.R.O., Div. of Met. Physics, Melbourne*), **The measurement of natural evaporation.** *Australian Institute of Agricultural Science, Melbourne, Journal*, 23(1):4–17, March **1957.** 2 figs., numerous refs., 6 eqs. **DLC**—A review based on extensive literature of methods of calculating evaporation from (a) the water balance, (b) the upward transport of water vapor near the ground, and (c) the energy considerations. Under (a) the use of free water surface evaporimeters, lysimeters, potential evapotranspirometers, and soil moisture profiles; (b) the Dalton equation and aerodynamic and direct eddy flux approach to vapor flow calculation and (c) various equations for energy calculation of evaporation and (d) combinations of (b) and (c). Advantages and disadvantages of each method are weighed. The indirect (equation) methods are more flexible but the direct methods the only ones practicable where energy components are unknown or altered by vegetation, etc. *Subject Headings:* **1. Evaporation measurements 2. Evaporation instruments.**—*M.R.*

9.3–159 551.508.72:551.573:551.579

*Pushkarev, V. F., **Issledovanie metodov nabliudeniĭ nad ispareniem s pochvy.** [Investigations on the methods for observing soil evaporation.] *Leningrad. Gosudarstvennyĭ Gidrologicheskiĭ Institut, Trudy*, 45(99):5–65, **1954.** 41 figs., 40 tables, 22 refs. **DLC** (GB651.L38)—In this paper the author 1) presents a critical analysis of results of the use of soil evaporimeters in the past; 2) describes the operation of a large size (5 sq m by 2 m height) hydraulic evaporimeter at Valdag Scientific-Research Hydrological Laboratory (VNIGL hydraulic evaporimeters); 3) compares the values of evaporation measured by means of evaporimeters of different design and size; 4) discusses the heat and water regime of soil evaporimeters; 5) presents data on infiltration of precipitation in the underlying soil layers, and 6) evaluates the influence of ground waters on the magnitude of evaporation from the surface of the soil. *Subject Headings:* **1. Soil evaporimeters 2. Evaporation from soil.**—*A.M.P.*

SYNOPTIC ANALYSIS AND FORECASTING

See also: **Cirrus forecasting** (Stone), 9.3–21; **IGY, 1957/1958, met. programme** (WMO), 9.3–26; **Historic London weather station** (Hawke), 9.3–52; **Daily weather mass** (Hamburg. Seewetteramt), 9.3–72; **Ocean wave forecasting** (Niche), 9.3–76; **How you can forecast potato blight** (Grainger), 9.3–108; **Mean temp. as precip. type predictor** (Wagner), 9.3–221.

9.3–160 551.509.57:551.515.2:551.461.2

Conner, W. C.; Kraft, R. H. (*both, U. S. W. B. Off., New Orleans, La.*) and Harris, D. Lee (*U. S. W. B., Wash., D. C.*), **Empirical methods for forecasting the maximum storm tide due to hurricanes and other tropical storms.** *Monthly Weather Review*, Wash., D. C., 85(4):113–116, April **1957.** fig., 2 tables, 13 refs., 10 eqs. **DWB, DLC**—A simple model of hurricane pressure-wind speed relations is used to derive an empirical formula for predicting maximum tides in connection with hurricanes "landing" on the continent of North America in the Gulf of Mexico or along the Atlantic seaboard. Thirty cyclones (1893–1950) for which tide data were available are analyzed and the maximum tide plotted against lowest pressure of storm as it crossed the coast. For the Gulf coast, where normal tides are <1 ft, the values can be used as storm tide predictions, allowing for local orographic effects. For the Atlantic coast the astronomical tide and time of surge must be considered. Value of this formula is tested against 8 Atlantic and 2 Gulf hurricanes (1926–56), the actual tides agreeing very well with prediction curves. Central pressure was found to account for $\frac{1}{2}$ of the total variability of storm surge height on the open coast. Other meteorological parameters tested did not improve the equation since they are masked or confused by local factors. *Subject Headings:* **1. Hurricane tide forecasting 2. Eastern United States coast.**—*M.R.*

9.3–161 551.509.5:551.579.5:519.241.11

*Ford, Perry M., **Multiple correlation in forecasting seasonal runoff.** *U. S. Bureau of Reclamation, Engineering Monographs*, No. 2, (rev.), June **1953.** 38 p. 5 figs., 13 tables, foot-ref., 23 eqs. **DWB** (M79.6 F711m)—Emphasis in this monograph is on the application of multiple regression techniques to forecasting seasonal runoff, using several independent variables (Oct.–Jan. precip., April 1 snow water content, April–July precip.) and one dependent variable (April–July natural runoff). Runoff-season precip. is not known in advance but can be used in developing the regression curve. An additional independent variable may be added if absolutely necessary, but it is shown how better results may be had, if records are short, if fewer independent variables are used. The method is demonstrated for single tributary basins in Idaho, Colorado, Montana, etc. Every angle of computation and testing is considered. Finally, forecasts for large basins are treated briefly. *Subject Headings:* **1. Multiple correlation forecasting 2. Seasonal runoff forecasting 3. Hydrological forecasting.**—*M.R.*

9.3–162 551.509.56:551.515.4:551.576.1

Žak, M., **O pretskazivanju grmljavina.** [On the forecasting of thunderstorms.] *Yugoslavia. Hidrometeorološka Služba, Vesnik*, 5(3/4):117–119, July/Dec. **1956.** fig., 3 tables. **DWB**—The reliability of the appearance of altocumulus castellatus clouds as an indicator of thunderstorm occurrence was tested by observations made at Pančevo in June and July 1955 and 1956. Ac cast. was observed on 18 occasions and thunderstorms followed in all cases but one. In 7 out of these 17 cases thunderstorms occurred 1–4 hours after the appearance of Ac cast., in 7 cases 7–10 hours and in 3 cases 14–16 hours after Ac cast. observation. The total number of thunderstorm days during the period was 24. *Subject Headings:* **1. Thunderstorm forecasting 2. Altocumulus castellatus clouds.**—*G.T.*

9.3–163 551.509.58:551.579.4

Means, Lynn L. (*Weather Forecast Center, Chicago, Ill.*), **Some basic parameters associated with the flood rains at Chicago, October 9–12, 1954.** *Monthly Weather Review*, 84(7):253–260, July **1956.** 13 figs., 8 refs. **DWB, DLC**—In order to account for the heavy rainfall, the author investigates whether the occurrence of low level convergence and vertical motion "could be accounted for by terms in the vorticity equation associated with vorticity advection, thermal

dvection and stability." Data for the Chicago flood situation are analyzed in the various unctional terms of the development equation. The possibility of identifying the mechanism esponsible for the potential instability and forecasting the parameters associated with such a weather situation is discussed. *Subject Headings:* **1. Flood forecasting 2. Floods, Chicago 1954) 3. Chicago, Ill.**—*I.L.D.*

STRUCTURE AND PHYSICS OF THE ATMOSPHERE

COMPOSITION OF THE ATMOSPHERE

See also: **Oxone** (Paetzold, Regener), 9.3–12; **Oxygen in Antarctic air** (Kanivisher), 9.3–44; **Determ. of air density from satellite** (Spitzer), 9.3–85; **Data for determ. of permissible cadmium concentration** (Mel'nikova), 9.3–119.

9.3–164 551.510.41:551.510.53

Michigan. Univ. Engineering Research Institute, **Collection and analysis of upper-air samples.** Contract DA-36-039 SC-56737, Project DA 3-99-07-022, Project SC 172B, Quarterly Reports, No. 1, 2, 3, 4, Oct. 15, 1954–Oct. 15, 1955: and Final Report, Oct. 15, 1954–Dec. 31, 1955. issued Feb. 15, 1955–Feb. 1956. 5 pieces. about 10 p. each. figs. (incl. photos), tables, refs., eqs. **DWB** (M10.53 M624c)—This series of brief technical reports gives the details of the development of a selective adsorption gas analyzer for measuring the helium and neon content in upper air samples obtained at the peak of an aerobee rocket sounding (30,700 km). A study was also made of the possibility that "separation" was a result of flow phenomena during sampling. Sampling bottles which were developed in a previous contract, have been improved along with methods of sampling. Details of equipment are shown in illustrations. *Subject Headings:* **1. Upper air sampling and analysis 2. Helium in upper atmosphere 3. Neon in upper atmosphere 4. Aerobee rocket instrumentation. I. Jones, L. M. II. Wenzel, E. A.**—*M.R.*

9.3–165 551.510.41:546.291

Nicolet, Marcel, **The aeronomic problem of helium.** *Annales de Géophysique*, Paris, 13(1):1–21 Jan./Feb. **1957.** 3 figs., 4 tables, 39 refs., 35 eqs. French summary p. 1. Also this: **L'hélium dans l'atmosphère terrestre.** [Helium in the earth's atmosphere.] *Belgium. Institut Royal Météorologique, Contributions*, No. 33, **1957.** 5 p. 7 refs., 4 eqs. "Reprint from *l'Académie Royale de Belgique, Classe des Sciences, Bulletin*, Oct. 6, **1956,** p. 956–959." **DWB**—The atmospheric balance of He is established by calculating its production from telluric sources (He^4) and cosmic rays (He^3), its concentration at different atmospheric levels and its escape, assuming various thermopause temperatures. The conclusion is reached that high thermopause temperature cannot solely account for the existing He distribution, but the existence of a mixing mechanism below 100 km altitude, limiting the upward flow of He has to be assumed.—In the paper on **Contributions** the same calculations are reported in an abridged form. *Subject Headings:* **1. Helium atmosphere 2. Tropopause temperatures.**—*G.T.*

ATMOSPHERIC POLLUTION

See also: **Atmos. pollution** (Meetham), 9.3–5; **Air pollution, Conn.** (McCaldin), 9.3–126; **Hygienic significance of atmos. pollution** (Afkhipov), 9.3–130; **Radioactive fallout, Norway** (News of Norway), 9.3–134; **Radiation control, Savannah River Lab** (Nichols), 9.3–135.

9.3–166 551.510.42:628.53

Lessing, R., **Coal and air pollution.** *Fuel Society, Univ. of Sheffield, Journal*, 7:14–18, **1956.** fig., table. Abstr. from reprint.—As a result of London fog of Dec. 1952 which caused 4000 deaths, BEAVER Committee was appointed and Government laid "Clean Air Bill" before Parliament. Pollutants consist of smoke (tar), grit and dust, and SO_2. Characteristics of coals in relation to air pollution are considered. *Subject Heading:* **1. Atmospheric pollution.**—*C.E.P.B.*

9.3–167 581.16:613.15:551.510.41

Gurney, Clifford W. and Cryst, Sydenham, **Aeroallergen studies with the molecular filter membrane.** *Journal of Allergy*, St. Louis, 26(6):533–541, Nov. **1955.** 8 figs., 15 refs. **DLC**—Diurnal variation in ragweed pollen (allergen) content of air at Ann Arbor, Mich., was studied on the basis of filter samples made on Aug. 23–Sept. 19, 1954. Highest concentration occurred near noon, lowest near 4 a.m., but a slight secondary maximum at midnight. Only a remote relation could be found between time of increased allergy symptoms and time of maximum ragweed concentration. Hence, the elaborate method of allergen determination described and illustrated here is not recommended for general use as a replacement of the simpler methods now in practice. *Subject Headings:* **1. Ragweed pollen count variations 2. Allergies 3. Ann Arbor, Mich.**—*I.L.D.*

UPPER ATMOSPHERE—IONOSPHERE

See also: **Fine structure and irregularities of ionosphere** (Pfister), 9.3–83; **Upper air collection and analysis** (Mich. Univ.), 9.3–164; **Arctic stratos. temp. diurnal variations** (Belmont), 9.3–193; **Atmos. temp. variations** (Morozov), 9.3–194; **Ionospheric sonde comparison** (Lejay), 9.3–275; **Solar eclipse effect on lower ionosphere** (Nagata), 9.3–276; **F2 layer during eclipses** (Minnis), 9.3–278; **Temp. and electron density in F region of ionosphere** (Mariani), 9.3–282; **Electron densities of ionosphere** (Baker), 9.3–283; **Ionized layer formation** (Bates), 9.3–284.

9.3–168 551.510.535:541.12

Bates, D. R. (*Dept. of Applied Math., Queen's Univ., Belfast*), **Recombination in the ionosphere.** (In: **Solar eclipses and the ionosphere: a symposium** . . . ed. by W. J. G. Beynon and G. M. Brown. London, Pergamon, **1956.** p. 191–197. 24 refs., 27 eqs.) **DWB**—A survey is given of the hypotheses concerning recombination in the ionosphere: amongst the collision processes considered are radiative recombination, charge transfer, ion-atom interchange, dissociation recombination, attachment, ionic recombination, and complexion formation. *Subject Heading:* **1. Recombination in ionosphere.**—*Author's abstract.*

9.3–169 551.510.535:551.510.62

Nakai, Taketosi, **The distance of the source and the height of reflection deduced from the waveforms of ionospheric reflection type.** *Nagoya. Univ. Research Institute of Atmospherics, Proceedings*, 4:20–28, Dec. **1956.** 6 figs., table, 2 refs. **DWB**—The effective height of reflection (h) in the ionosphere and the distance of the source (d) were estimated by the reflection theory in the use of the waveforms of the regular peaked type observed in Toyokawa in June 1950; h is found to be about 85±5 km and d is estimated to the accuracy which is approximately proportional to the reciprocal of the distance of propagation. The derived values for d were compared with good quality C.R.D.F. Fixes and the results showed fair agreement. These results are described in this paper, but particular emphasis is given to a possible range of solutions for h and d deduced by a graphical method of analysis or deduced from the reflection theory and it is discussed that practicability of estimating h or d to a useful accuracy from the waveforms reflected in the ionosphere depends on the distance itself or the number of recorded echoes and the discrepancies which occur between the recorded and ideal sequences of echoes. *Subject Headings:* **1. Reflecting layer height 2. Ionospheric reflection.** —*Author's abstract.*

9.3–170 551.510.535:551.510.62

Wait, James R. and Murphy, Anabeth (*Nat. Bur. of Standards, Boulder, Colo.*), **Multiple reflections between the earth and the ionosphere in V.L.F. propagation.** *Geoficisa Pura e Applicata*, Milan, 35:61–72, Sept./Dec. **1956.** 8 figs., 9 refs., 15 eqs. **DLC**—Treating the ionosphere as a sharply bounded ionized medium, sky wave field intensities are calculated by geometrical-optical methods for very low radio frequencies. The reflection coefficients are discussed in some detail and the numerical data are compared with experiment. *Subject Headings:* **1. Ionospheric radio wave reflection 2. VLF propagation.**—*Authors' abstract.*

MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

See also: **Dynamic met.** (Gandin et al.), 9.3–7.

9.3–171 551.511:551.521

King, Jean I. F., **The radiative equilibrium of non-grey terrestrial atmosphere.** *I.U.G.G. Association of Meteorology, Rome, Sept. 1954, Scientific Proceedings.* London, Butterworth, **1956.** p. 577–581. 3 figs., refs., 6 eqs. **DWB**—The mathematical technique, termed the "method of discrete ordinates," developed by CHANDRASEKHAR was devised for the solution of stellar radiative equilibrium problems, particularly temperature distributions in the semi-infinite atmosphere of stars. This theory is outlined with particular reference to its applications to the earth's atmosphere. "The results of preliminary calculations, presented in graphs, indicate that (1) the radiation emerging from the top of a semi-infinite equilibrium atmosphere is always less for the non-grey than for the corresponding grey case; (2) the ratio of the emergent limb intensities of the non-grey and the grey atmospheres is given exactly as the negative square root product of the arithmetic and harmonic absorption coefficient means; and (3) for terrestrial band-model atmospheres of optical thickness less than unity which are irradiated primarily from below, the effect of line structure invariably acts to steepen the equilibrium lapse-rate." *Subject Heading:* **1. Radiative equilibrium.**—*Author's summary and I.L.D.*

9.3–172 532:551.511

Philip, J. R. (*Div. of Plant Industry, C.S.I.R.O., Deniliquin, N.S. Wales*), **Transient fluid motions in saturated porous media.** *Australian Journal of Physics*, Melbourne, 10(1):43–54, March **1957.** 4 figs., 9 refs., 9+ eqs. **DLC**—The transition from rest to steady motion on the sudden application of a potential gradient to the fluid contained in a saturated porous medium is investigated. An approximate analysis gives the result that the time of the effective establishment of the steady motion is proportional to the permeability and inversely proportional to the kinematic viscosity. Two exact solutions (one of them new) for simple cases suggest that the approximate analysis is remarkably accurate. An analogy between this problem and one in heat conduction makes the relevant results in that field immediately applicable here. The analysis is extended to motion with the time variation of the applied potential gradient quite general. Certain properties of the motion when the potential varies periodically are determined, and the simple harmonic case is studied in some detail. It is found that the error in using Darcy's law (which neglects the transient phase) will usually be unimportant for the case of a suddenly applied potential gradient. However, significant deviations from Darcy's law may occur when the applied potential gradient is periodic, even for systems of quite low frequency. The equations derived from the approximate analysis may be regarded as generalizations of Darcy's law which take into account time variation of the applied potential gradient. *Subject Heading:* **1. Fluid mechanics.**—*Author's abstract.*

9.3–173 551.511:532.5

Yih, Chia-shun (*Iowa Inst. of Hydraulic Res., State Univ. of Iowa*), **On stratified flows in a gravitational field.** *Tellus*, Stockholm, 9(2):220–228, May **1957.** 19 refs., 52 eqs. **DLC**—This paper, which is restricted to the flow of inviscid fluids, is divided into three parts. In the first part existing formulas by A. R. RICHARDSON, HANS LEWY, and K. N. TONG for constructing free-surface flows are identified with one another so that potential flows of one fluid in contact with a stagnant layer of another fluid can be constructed exclusively from one general formula, with proper modification of the gravitational acceleration. Further, a method for constructing potential flows of two fluids having a common interface (which may or may not be prescribed) is devised. It is hoped that this method will be of some use in the investigation of internal gravity waves. In the second part, it is shown that, for flows of a fluid system of discrete layers, LONG's equation of motion for two-dimensional flow of an inhomogeneous fluid reduces to the Laplace equation for each layer (if the flow is irrotational) and the usual boundary conditions at the interfaces, so that flows with discontinuous density variations can be properly considered as limiting cases of flows with continuous ones. For the sake of completeness, equations of motion of an inhomogeneous fluid in axisymmetric motion in cylindrical and spherical coordinates are also given. In the third part the stability of a

periodic disturbance present in a parallel flow with continuous density variation is discussed. Sufficient conditions for stability are found, and an upper bound for the amplification factor is given (if instability occurs) for a general class of flows. *Subject Headings:* **1. Fluid dynamics 2. Stratified fluid flow.**—*Author's abstract.*

GENERAL CIRCULATION

See also: **500 mb jet structure** (Conner), 9.3–180; **Momentum exchange between atmos., oceans and earth** (Palmén), 9.3–202.

9.3–174 551.5133

Wexler, Harry (*Chief, Scientific Services Div., U. S. W. B.*), **Circulation of the atmosphere.** *Scientific American*, N. Y., 193(3):114–124, Sept. **1955.** photo, figs. **DWB, DLC**—In this concise and graphic description of the atmospheric circulation, the author discusses the solar energy as the motive power of the atmosphere, the classic hypothetical picture of the general circulation with its individual cells, E. Palmén's modification of the cell model, the transport of momentum and energy in the atmosphere and the circulation between the troposphere and stratosphere. The program for studies of the general circulation during the International Geophysical Year is outlined. *Subject Headings:* **1. Atmospheric circulation 2. Solar energy 3. IGY program.**—*I.L.D.*

9.3–175 551.513.1:551.43

§Gregor, Zdeněk, **Orografické deformace jihovýchodního proudění ve střední Evropě.** [Orographic deformations of southeasterly circulation in Central Europe.] *Meteorologické Zprávy*, Prague, 10(1):3–6, **1957.** 7 figs., 6 refs. Russian and German summaries p. 3. **DWB**—The atmospheric circulation from the Balkans through Hungary to the northwest is forced through a narrow path between the Alps and the Carpathians, which causes the air stream to accelerate. This process is analyzed by means of synoptic charts. A method is proposed for improving forecasts of the surface pressure field by accounting for the orographic deformation. *Subject Headings:* **1. Orographic effects on atmospheric circulation 2. Orographic deformation 3. Synoptic analysis 4. Pressure forecasting 5. Alps.**—*Trans. of author's abstract.*

9.3–176 551.513.3:551.524.7(68)

§Triegaardt, D. and Kraus, G., **Aerological study of a polar outbreak in the African sector, Aug. 27–Sept. 1, 1956.** *South Africa. Weather Bureau, Notos*, 5(4):229–234, **1956.** 6 figs., 2 tables, 9 refs. **DWB**—Upper air temperatures were well below the average over South Africa during the period 27th Aug. to 1st Sept., 1956, and record low temperatures were observed at Bloemfontein on 28th Aug. The 500 mb charts for the six consecutive days show that a trough of large amplitude remained almost stationary over Southern Africa during this period. The amplitude reached maximum values on the 28th and 1st. The surface situation during this period suggests that an intense Indian Ocean anticyclone, in a relatively southerly position, had a blocking effect on the zonal flow. *Subject Headings:* **1. Upper air temperatures 2. Polar outbreak 3. Blocking action 4. South Africa.**—*Authors' abstract.*

ATMOSPHERIC DISTURBANCES

See also: **Summer cyclogenesis, W. Canada** (Hage), 9.3–9; **Tropospheric temp. changes in anticyclones, Lindenberg** (Grosnick), 9.3–10; **Radar storm detection** (Ligda), 9.3–16; **Forecasting methods of maximum storm tide** (Conner et al.), 9.3–160; **Thunderstorm forecasting** (Zak), 9.3–162; **Heavy snowstorm, New Eng., March 1956** (Mook), 9.3–249.

9.3–177 551.515:525.63:551.461.2

Fedorov, K. N., **Uroven' i techeniia vo vremia katastroficheskogo shtorma v Severnom more v 1953 g.** [Water level and currents during the catastrophic storm of 1953 in the North Sea.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 4:437–451, April **1956.** 7 figs., 4 tables, 14 refs., 17 eqs. **DLC**—The author attempts to explain the nature of the circulation

f the waters of the North Sea during the height of development of the storm surge, when the se in level has ceased almost everywhere and the dissolution of the surge has not yet begun. he more methodological aim is to utilize shore observations on water level in order to calculate ne gradient portion of the total current produced by the wind. A formula is developed for nterpolating the longitudinal slopes of the water level in a strait with variable cross sections, pplicable to conditions at Pas-de-Calais when a stationary storm surge is on one side of the trait. The mean daily discharge of water into the strait is calculated. A map of the topogaphy of the storm surge and of the currents in the southern part of the North Sea were constructed. The calculated elements of the currents were compared with observations during storm by means of floating lights. *Subject Headings:* **1. Storm floods, North Sea (Feb. 1953) 2. Storm surges 3. Sea level variations 4. Wind driven currents 5. North Sea.**—*I.L.D.*

9.3–178 551.515:525.63:551.461.2

§Poncelet, Lucien, **Aperçu des circonstances météorologiques et climatologiques de la empête des 31 janvier et 1er février 1953.** [Summary of the meteorological and climatoogical circumstances of the storm of Jan. 31 and Feb. 1, 1953.] *Belgium. Institut Royal Météorologique, Contributions*, No. 21, **1955.** 43 p. 23 figs. (incl. charts), 11 refs. **DWB, DLC**—A storm, resulting in a catastrophic increase of the sea level, is analyzed on the basis f sea level pressure maps, as well as 700 mb surfaces. Some characteristic results of aerological oundings are presented, and air trajectories are shown. The results are compared with istoric storms and a statistical analysis of catastropic floods is presented. A nomogram hows how to predict such floods. *Subject Headings:* **1. Storm floods, North Sea (Feb. 1953) 2. Sea level forecasting 3. Flood forecasting 4. Belgium 5. North Sea.**—*A.A.*

9.3–179 551.515.11

Urbani, Marcello, **Sulla ciclogenesi nel Mediterraneo durante l'estate.** [Cyclogenesis ver the Mediterranean during summer.] *Rivista di Meteorologia Aeronautica*, Rome, 7(3):15–21, July/Sept. **1957.** 2 figs., 3 tables. French, English and German summaries . 15. **DLC**—Cases of cyclogenesis in the Mediterranean area during the period 1946–1955 re analyzed. Monthly and annual frequencies of cyclogenesis are first tabulated (total 140 ases). The Mediterranean area is then subdivided into 13 regions (shown on map) and the umber of cyclogenesis cases and months and years of maximum occurrence are tabulated or each of these regions. Cyclogenesis in each region is also correlated with one or several f seven circulation types established for Europe. Finally, the duration of cyclones is analyzed n relation to region of origin and weather type. An identical study is available for cyclogenesis over the Mediterranean in winter. *Subject Headings:* **1. Cyclogenesis 2. Mediterranean Sea.**—*G.T.*

9.3–180 551.515.3:551.513.1

§Conner, W. C. (*U. S. W. B., New Orleans, La.*), **Structure of the 500 mb jet in major ornado-genesis.** Wash., D. C., U. S. Weather Bureau, Jan. 9, **1956.** 12 p. 4 figs., 2 refs. **DWB** (M15.3 U587str)—Minimum requirements for the formation of tornadoes (in relation o 850 and 500 mb circulation) are set forth and illustrated. A study of 30 cases of major ornado days in the South (1945–54) showed that the average 850 mb jet was 48 kn and verage 500 mb jet was 73 kn but the lower limit for tornado genesis is more like 30 and 45 n, respectively. Four synoptic examples are cited. It is concluded that a closed cold lower rough with a jet maximum south or southeast of center and 500 mb temp. −20°C or colder n core, and strong zonal flow or a split jet are favorable for tornadoes within 300 m to right f jet or 200 mi downstream, etc. (*See* 6.9–142, Sept. 1955, *MAB.*) *Subject Headings:* **1. Tornado genesis 2. 500 mb jet.**—*M.R.*

9.3–181 551.515.4(497.1)

*Malovčak, P., **Statističko-tabelarni pregled i grafički prikaz čestina grmljavine za grad Osijek.** [Statistical tables and graphs of thunderstorm frequency for the city of Osijek.] *Vugoslavia. Hidrometeorološka Služba, Vesnik*, 4(1/2):41–47, Jan./June **1955.** 5 figs., 2 ables. Also: **. . . za grad Crikvenicu.** [. . . for the city of Crikvenica.] *Ibid.*, 5(3/4):120–23, July/Dec. **1956.** 4 figs., 3 tables, 3 refs. **DWB**—The first paper includes data on daily,

monthly and annual distribution of thunderstorm days at Osijek over the period 1901–1954 also comparative presentation of annual march of thunderstorm frequency at Zagreb, Pozeg and Osijek. Date of first and last occurrence of thunderstorms at Osijek is shown for each 5-year period from 1884 to 1954. In the second paper thunderstorm data for Crikvenica are presented in the same arrangement and for the same period (1901–1954) as those in the first for Osijek. Graphs are drawn on the same scale to facilitate comparison. Such comparison may be of particular interest as Osijek represents continental and Crikvenica maritime climate. *Subject Headings:* **1. Thunderstorm frequencies 2. Thunderstorm distribution 3. Osijek, Yugoslavia 4. Crikvenica, Yugoslavia.**—*G.T.*

9.3–182 551.515.8:551.55

Dogadkina, N. P. and Diubiuk, A. F., **Vertikal'nye skorosti v oblasti statsionarnogo fronta.** [Vertical velocities in the region of a stationary front.] *Moscow. Tsentral'nyi Institut Prognozov, Trudy*, 45(72):65–73, **1956** 3 refs., 2 tables, 2 figs., 24 eqs. **DLC**—In addition to the effect of friction in the regions of the front, the author takes into account the friction of the layer of atmosphere near the earth's surface and the curvature of the isobars upon the formation of vertical velocities in the vicinity (ω) of a stationary front. It is shown that vertical air motion always arises since air glides along the frontal line. Formulas describing these currents are developed. A table is presented giving vertical velocities in the vicinity for different fronts taking into account the influence of the atmosphere near the earth's surface for different frontal heights. *Subject Headings*: **1 Stationary fronts 2 Vertical velocities 3 Vertical currents.**—*I.L.D.*

RADIATION AND TEMPERATURE

RADIATION

See also: **Arrival of auroral radiations** (Van Allen), 9.3–87; **Cosmic-ray obs. in earth satellites** (Van Allen), 9.3–88; **Equilibrium of terrestrial atmos.** (King), 9.3–171; **Diffuse radiation calculation** (Lenoble), 9.3–188; **Daily temp. variation and sunshine duration** (Steinhauser), 9.3–190; **Propagation of visible and infrared light** (Bricard), 9.3–279.

9.3–183 551.521:536.53:551.508.21

*Lugovskaia, M. A. and Pokrovskaia, I. A., **Pogreshnosti poverki termoelektricheskikh aktinometrov i piranometrov.** [Correction of errors of thermoelectric actinometers and pyranometers.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy*, 61(123):120–134, **1956.** 3 figs., 11 tables, 4 refs. **DWB**—Authors present a review of various types of errors experienced during tests of instrumental accuracy carried out, both under natural conditions at Boeikovo, and during expeditions to Kamennaia Steppe and to the Dubovskaia runoff station in 1951–1954, and under laboratory conditions on devices of the Central Bureau of Verification. Data are given in extensive tables and graphs. *Subject Headings:* **1. Radiation instrument errors 2. Thermoelectric actinometers 3. Thermoelectric pyranometers 4. U.S.S.R.**—*A.M.P.*

9.3–184 551.521.1:541.14

Béll, Béla, **Fotokémiai napsugárzásmérések.** [Photochemical measurement of solar radiation.] *Időjárás*, Budapest, 60(6):342–349, Nov./Dec. **1956.** 5 figs., 6 tables, 7 refs. English summary p. 342. German translation p. X–XVI. **DLC**—Results of preliminary measurements made at Tihany during the summer 1955 are presented. It is found that the oxalic acid and uranyl salt method used is sufficiently accurate and simple enough for application in meteorological routine observations, especially in the field of medical meteorology. *Subject Headings:* **1. Solar radiation measurement 2. Photochemical method 3. Tihany, Hungary.**—*Author's abstract.*

9.3–185 551.521.1

Fritz, Sigmund (*U. S. W. B., Wash., D. C.*), **Solar energy on clear and cloudy days.** *Scientific Monthly*, Wash., D. C., 84(2):55–65, Feb. **1957.** 9 figs., table, 27 refs. **DLC**—This

article represents a clear and concise summary of the essential facts regarding amount of solar energy received by the earth's atmosphere, atmospheric effects on this radiation, scattering by air, dust and water vapor, absorption by O_3 and water vapor in selected bands, cloudless sky radiation, cloud effects, albedo, absorption in clouds, amount of solar energy available at the ground on horizontal, inclined and vertical surfaces, and finally geographic and seasonal variations. Maps of the U. S. show isolines of average solar radiation on a horizontal surface in July and Dec., and actual values at a score of stations. Graphs show spectral distribution of energy, transmittance, absorption, sky radiation, etc. in great detail. *Subject Headings:* **1. Solar radiation on clear days 2. Cloud effects on radiation 3. Radiation charts 4. United States.**—*M.R.*

9.3–186 551.521.11:551.577

Steinhauser, Ferdinand, **Die Sonnenscheindauer an Niederschlagstagen in Österreich.** [Sunshine duration on days with precipitation in Austria.] *Wetter und Leben*, Vienna, 8(5/7):95–104, 1956. 2 figs., 3 tables, 8 refs. **DWB**—A more refined analysis of the characteristics of rainy days involves not only the study of the hourly rainfall but also the sunshine duration during the course of the day. Numerical data are given on the mean monthly duration of sunshine in hours on days with precipitation for various stations in Austria, mean sunshine duration on days with precipitation expressed as percent of sunshine duration during the mean of all days, and in percent of effective possible sunshine duration and percent probability that the sun shines more than zero hours on days with rainfall. *Subject Headings:* **1. Sunshine duration-precipitation relationships 2. Vienna, Austria.**—*I.L.D.*

9.3–187 551.521.3

Kuznetsov, E. S., **Vychislenie koeffitsientov pogloshcheniia vodianogo para pri otkloneniiakh ot zakona Buge.** [Calculation of absorption coefficient of water vapor by departure from Bouguer's Law.] *Akademiia Nauk SSSR, Geofizicheskiĭ Institut, Trudy*, No. 23(150):3–25, 1954. 7 figs., 9 tables, 16 refs., 52 eqs. **DLC**—The author develops a mathematical method for determining coefficients of absorption of water vapor from coefficients of transmission or extinction by solving approximately the integral equation

$$p(w) = \frac{1}{2N}\int_{V_0-N}^{V_0+N} e^{-k(v)w}dv.$$

The equations obtained are used to calculate the coefficients of absorption of water vapor in the near infrared region of the solar spectrum (0.7μ–2μ). Tables of values of the absorption coefficients are presented. *Subject Headings:* **1. Absorption coefficients 2. Absorption of water vapor.**—*I.L.D.*

9.3–188 551.521.31:551.575.1

Lenoble, J. (*Chargée de recherches au C.N.R.S.*), **Calcul du rayonnement diffusé dans une couche de brume.** [Calculation of diffuse radiation in a fog layer.] *Journal Scientifique de la Météorologie*, Paris, 8(29):23–28, Jan./March 1956. 2 figs., 2 tables, 3 refs., eqs. French, English and Spanish summaries p. 23. **DWB**—Extensive tables based on Chandrassekhar's method are presented for determining the luminance of a layer of dense mist (fog) with large drops and without considering true absorption, for a case where the fog is illuminated by a uniform sky with the sun 30° above the horizon. *Subject Headings:* **1. Diffuse radiation in fog 2. Illumination in fog.**—*Partly from author's abstract, M.R.*

9.3–189 551.521.64

Herlofson, N. (*Royal Inst. of Technology, Stockholm*), **Accelerated dust grains and the highest cosmic ray energies.** *Tellus*, Stockholm, 8(2):268–273, May 1956. fig., 4 tables, 8 refs., 14 eqs. **DLC**—The author investigated the events following the impact of a cosmic dust grain with the atmosphere and attempts to indicate "how such primary particles, if they exist, might be identified and how their rigidities can be estimated by cosmic ray observations." The discussion deals with the theoretical and mathematical aspects of the determination of the maximum electric charge on a grain, nuclear interaction occurring during the impact of

a fast grain into the atmosphere, the structure of electron showers at sea level and the structures of the meson shower at ground level. "Some similarity was found between expected showers and observations on the largest cosmic ray showers." It is concluded that the largest air showers are initiated by primaries accelerated outside the solar system, whether the primaries are dust grains or single nuclei." *Subject Headings:* **1. Cosmic ray showers 2. Cosmic dust grains.**—*I.L.D.*

TEMPERATURE

See also: **Temp. change of troposphere . . . Lindenberg** (Grasnick), 9.3–10; **Temp. data, Japan** (Japan. Met. Agency), 9.3–19; **Testing of frost protection apparatus** (Aichele), 9.3–106; **Determ. of soil warming** (Chirkov), 9.3–107; **Microclimatic temp. effect** (Lake), 9.3–113; **Damage to west Washington forests** (Duffield), 9.3–115; **Polar outbreak** (Triegaardt), 9.3–176.

9.3–190 551.524.31:551.521.11

*Steinhauser, F. (*Vienna*), **Über die Abhängigkeit der Tagesschwankung der Temperatur von der Sonnenscheindauer in Wien.** [The dependence of the daily variation in temperature at Vienna on sunshine duration.] *Wetter und Leben*, Vienna, 7(7):141–151, **1955.** 2 figs., 4 tables, 5 refs. **DWB, DLC**—This study is based upon 15 years (1940–1946) of insolation data. Data, presented both graphically and tabularly, show the dependence of the daily variation of air temperature upon sunshine duration during the individual seasons, a comparison between the daily variations of air temperature and of soil temperature at depths of 1 cm as influenced by sunshine duration, frequencies of air temperature variations as a function of daily sunshine duration and the difference between the upper and lower quartiles by seasons. *Subject Headings:* **1. Diurnal temperature variations 2. Sunshine duration 3. Vienna, Austria.**—*I.L.D.*

9.3–191 551.524.36:551.571.36

§*Bultot, Franz, **Distribution conjointe de la température et de l'humidité de l'air au Congo Belge.** [Simultaneous distribution of the temperature and the humidity of the air in the Belgian Congo.] *Institut National pour l'Étude Agronomique du Congo Belge, Brussels. Bureau Climatologique, Communication*, No. 14, **1957.** 15 p. 10 figs., 2 tables, 2 refs., eqs. **DLC**—Data for 1955 for 8 stations in the Belgian Congo (Bambesa, Baketa, Yangambi, Nioka, Tshibinda, Mvuazi, Gandajika and Keyberg) are analyzed to show the 95% distribution zone (graphically) of simultaneous occurrences of temperature (t) and relative humidity (U), or temperature and vapor pressure (e) (mb); based on 8750 hourly values. A randomly selected table of 100 values of T and e for Bambesa is presented to show normality of distribution and the statistical methods described. A year's values, in this region, are said to be a sufficient sample of the population. The 3 stations S. of 4°S are not normally distributed because of a long dry season, so the method used for the other does not apply. In these 3 cases a graphical stratification of the distribution for each season and for the whole year is used instead of a mathematically derived envelope, as for the 5 stations north of 4°S. *Subject Headings:* **1. Temperature frequencies 2. Humidity frequencies 3. Vapor pressure frequencies 4. Belgian Congo.**—*M.R.*

9.3–192 551.524.36(495)

*§Karapiperis, Leon. N. (*Univ. of Athens, Greece*), **On the great and abrupt falls of air temperature in Athens.** *Geofisica Pura e Applicata*, Milan, 35:143–148, Sept./Dec. **1956.** 4 figs., 3 tables. **DLC**—This note deals with the great and abrupt falls of air temperature in Athens which occur especially during the cold season of the year. The frequency of these falls, the greatest falls noted per month and the weather situations associated with these falls are examined separately. It is found that the weather situations which cause the great falls of air temperature in Greece can be classified in four categories: A, B, C and D. In A belong the anticyclones of N. and N.W. Europe both moving and stationary. B comprises the extensions of the anticyclone of the Azores over Europe. In C belongs the extension of the Russian anticyclones and D comprises the cold fronts of depressions moving from W. to E. *Subject Headings:* **1. Extreme temperatures 2. Temperature drop 3. Minimum temperature frequencies 4. Athens, Greece.**—*Author's abstract.*

9.3–193 551.524.7:551.510.53(98)

*Belmont, Arthur D., **Apparent diurnal variations of Arctic stratospheric temperatures.** *American Geophysical Union, Transactions*, 38(4):462–468, Aug. **1957.** 3 figs., 2 tables, 18 refs. **DWB, DLC**—The diurnal variations of radiosonde temperature data for Narsarssuak (BW-1), Greenland, from 1946–1948 are inspected and compared with data for Thule, Alert, Eureka, and Resolute. Observations were taken at BW-1 at local noon and midnight. In winter and spring the stratospheric temperatures there show a tendency for the difference, noon minus midnight, to diminish or even become negative. Similar patterns for apparent night warming in the lower stratosphere are found also at the other stations. The eight years of more recent and reliable Arctic data which now exist should be made available to help determine the reality of this anomaly. Adiabatic semidiurnal vertical motions required to produce the observed night warming amount to 1 or 2 cm/sec. It is suggested that atmospheric tides may be a contributing cause. *Subject Headings:* **1. Temperature anomalies 2. Diurnal stratospheric temperature variations 3. Arctic.**—*Author's abstract.*

9.3–194 551.524.7:551.510.53

Morozov, V. M., **Ob opredelenii izmenenii temperatury vozdukha v stratosfere v zavisimosti ot vremeni putem prozhektornogo zondirovaniia.** [The determination of atmospheric temperature variations in the stratosphere as a function of time by means of sounding with a searchlight.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 3:366–371, March **1956.** 10 refs., 6 eqs. **DLC**—In this critical review the author analyzes the sources of error in the determination of stratospheric temperature changes with time. They are the result of incalculable variations in the penetrability of the atmosphere during the time of measurement. The searchlight technique is described and the role of atmospheric diffusion in the precision of the measurements of temperature changes is considered. *Subject Headings:* **1. Stratospheric temperature variations 2. Searchlight technique.**—*I.L.D.*

SOIL TEMPERATURE

See: **Soil freezing** (Natl. Res. Council), 9.3–2; **Soil temp. measurements** (Cook), 9.3–38; **Soil warming** (Chirkov), 9.3–107; **Effect of clear cutting and soil disturbance** (Gregory), 9.3–117.

WATER TEMPERATURE

9.3–195 551.526:656.6

†Wardlaw, R. L. (*National Research Council of Canada, Div. of Mech. Engr.*), **A study of heat losses from a water surface as related to winter navigation.** *Eastern Snow Conference, Proceedings*, v. 2, **1953–1954,** p. 7–14. 7 figs., 5 tables, 41 refs., eqs. **DWB**—Methods of computing the heat budget of water bodies are outlined, accounting for radiation, convection, evaporation and snowfall. The most reliable approaches are selected to analyze the probability of ice formation on the St. Lawrence Seaway in the case of a flow of 3 mph in a 35 or 60 ft deep channel. In the latter case winter navigation could be upheld even under severe weather. Details of the analysis are given in graphical form. *Subject Headings:* **1. Heat loss of water surfaces 2. Winter navigation 3. St. Lawrence waterway.**—*A.A.*

9.3–196 551.526.8

László ffy, Woldemár, **Folyóink és tavaink hőmérsékleti viszonyai.** [Temperature conditions of rivers and lakes in Hungary.] *Hungary. Vízgazdálkodási Tudományos Kutató Intézet, Beszámoló . . . évi munkájáról*, 1955:131–146, pub. **1956.** 3 figs., 4 tables, 11 refs. Russian and French summaries p. 366–367. **DWB**—Monthly and annual means of water temperature (1946–1952) are tabulated for 16 rivers and 2 lakes in Hungary, measured at 35 points. Diurnal variations are discussed. Comparative curves of water and air temperature are presented. In the lakes (shallow ones), water temperature is found to be more closely related to air temperature than in rivers. *Subject Headings:* **1. Lake temperatures 2. River temperatures 3. Diurnal water temperature variations 4. Hungary.**—*G.T.*

PRESSURE AND WIND

PRESSURE

9.3–197 551.543.1

*Rosenthal, Stanley L. and Baum, Werner A. (*Florida State Univ., Tallahassee*), **Diurnal variation of surface pressure over the North Atlantic Ocean.** *Monthly Weather Review*, Wash., D. C., 84(11):379–387, Nov. **1956.** 2 figs., 12 tables, 16 refs. **DWB, DLC**—Data from Ocean Weather Stations, A, B, C, D, E, H, J, K and M (lat. 66°N to 35°N, and 2°E to 70°W) for all available years from 1947–1955 are analyzed to determine the daily variations in mean surface (sea level) pressure, the 3-hourly mean pressure tendencies, and the harmonic analysis of the diurnal variation of mean pressure. The first, second and third harmonics (24 hr, 12 hr, and 8 hr) are discussed and data shown in tables and or charts. Results are compared with those of many other authors. *Subject Headings:* **1. Pressure variations over oceans 2. Diurnal pressure variations 3 Harmonic analysis of pressure data 4. Ocean weather station data 5. North Atlantic Ocean.**—*M.R.*

9.3–198 551.543.1

Zanoli, Elvio, **Sull'andamento diurno della pressione in Italia.** [Diurnal pressure variation in Italy.] *Rivista di Meteorologia Aeronautica*, Rome, 17(3):3–9, July/Sept. **1957.** 4 figs., table. French, English and German summaries p. 3. **DLC**—Curves of average diurnal pressure variation (for January, April, July, October and the year) are presented for 20 selected stations in Italy, including composite curves for the stations of Northern, Central and Southern Italy as well as for the whole country. The curves are based on 3-hourly measurements made during the period 1949–1956. All diurnal curves show a double periodicity (with one period in the morning and one in the afternoon). Correlations are found between the amplitudes of these periodicities, and latitude as well as continentality. *Subject Headings:* **1. Diurnal pressure variations 2. Pressure correlations 3. Italy.**—*G.T.*

TURBULENCE AND GUSTINESS

See also: **Great Plains Turbulence Field Program** (Lettau, Davidson, *eds.*), 9.3–1; **Analysis of airspeed** (Copp), 9.3–92; **Dynamic response of large airplane** (Diederich), 9.3–93; **Gust research at RAE** (Gt. Brit. Min of Supply), 9.3–95; **Invest. of forward-located fixed spoilers** (Croom), 9.3–96

9.3–199 551.551:533.15

*Frenkiel, F. N. and Katz, I., **Studies of turbulent diffusion in the atmosphere.** (In: U. S. Dugway Proving Ground. **Symposium on micrometeorology turbulent diffusion, June 28–29, 1954. 1956** p. 1–34. 13 figs., 3 tables, 10 refs., 16 eqs.) **DWB**—A general treatment of problem of turbulent diffusion from an intermittent point source and from a continuous point source, giving the data from the smoke puff experiments by Naval Research Laboratory at Tilghman Island, Md. (Feb. 27–28, 1950) and Kellogg's data for 1952 (titanium chloride vials exploded at 24–63 thousand ft), are analyzed. The 19 smoke puffs were set off from a tethered balloon, and filmed from 2 angles to obtain dispersion. After 10–20 sec, the dispersion ceased to follow the same law. The stratosphere data were tied in with pibal, radar and radiosonde data and were obtained by photography with 3 phototheodolites. These puffs grew linearly for about 9 min and then more slowly. Results of 2 tests are compared with those of Durst (1948) and Kampé de Fériet (1938) who used soap bubbles. *Subject Headings:* **1. Smoke puff dispersion experiments 2. Turbulent diffusion of gases 3. Tilghman Island, Md. I. Kellogg, W. W.**—*M.R.*

9.3–200 551.551.5:551.557

*§Anderson, A. D., **Free-atmosphere turbulence.** *U. S. Naval Research Laboratory, NRL Report*, 4735, June 1, **1956.** 90 p. 115 figs., 15 tables, 15 refs. **DWB** (M055 U586r)—Free-atmosphere turbulence data measured between 10,000 and 60,000 feet (Greensboro, N. C., Miami, Fla., Caribou, Maine and Grand Junction, Colo., Dec. 1951–Dec. 1952) by means of a parachuted telemetering instrument, the gustsonde, has been reduced to punched

card form with the corresponding meteorological data. An analysis of the approximately 1800 layers of free-atmosphere turbulence shows correlations between this turbulence and ranges of the following parameters: Richardson's number, vertical wind shear, lapse rate, wind speed and direction, temperature and relative humidity. Correlations are also found between this turbulence and the bases and tops of tropospheric inversions, and the base of the tropopause. Turbulence was found to be below normal at the top of the tropopause and at the lowest freezing level. The average thickness of the turbulent layers was 239 m, and 87% of the layers were less than 400 m thick. The altitude distribution shows three relative maxima (7400, 11,000 and 14,000 m) and three relative minima (6200, 9500 and 12,000 m), and exhibits a definite decrease above 15,000 m. *Subject Headings:* **1. Free air turbulence 2. Turbulence data.**—*Author's abstract.*

9.3–201 551.551.5

Farthing, E. D. [**Vertical and horizontal shear as major factors in clear air turbulence.**] *Trans World Airlines, Inc., K. C., Missouri, Meteorological Technical Bulletin*, No. 52–3 Nov. 13, **1952.** 2 p. fig., 2 refs. **DWB**—A review of findings of J. K. Bannon (1951) and J. Briggs (1952) in England, with respect to relation of high level turbulence to the jet stream and the tropopause. *Subject Heading:* **1. Clear air turbulence.**—*M.R.*

WIND DISTRIBUTION AND WIND VARIATIONS

See: **Consideration of cross winds in runway design** (Gerlach), 9.3–91; **Horizontal wind component** (Dady), 9.3–140; **Air flow measurement** (Zakazno), 9.3–141.

SPECIAL WINDS

See: **Föhn effects on cooling power** (Lauscher), 9.3–133.

WIND EFFECTS

See also: **Establishment of hygienic standard** (Itskova), 9.3–131.

9.3–202 551.556.8:551.465:551.513.1

Palmén, Erik (*Academy of Finland, Helsinki*), **On the exchange of momentum between the atmosphere, the oceans, and the solid earth.** *Journal of Marine Research*, New Haven, Conn., 14(4):465–476, **1955.** 5 figs., 15 refs., 9 eqs. **DWB, DLC**—A theoretical treatment of the methods that could be used to compute the wind stress on large ocean areas over extended intervals of time. The global wind system and the flow of angular momentum in the atmosphere across latitudes and the exchange between the angular momentum and the earth and the oceans are discussed. Three different methods of computing mean zonal stress in the trade wind belt, namely: (1) on the basis of surface wind, (2) on divergence of the meridional flux of angular momentum and (3) on the basis of departure from the geostrophic flow in the lower atmosphere, are discussed and the relevant equations and computations based upon these methods are compared. The computation of the mean wind stress on a water surface is derived and the calculations of the zonal component of the slope of the ocean surface is discussed. *Subject Headings:* **1. Wind stress 2. Angular momentum exchange air-earth-ocean 3. Ocean-atmosphere interaction.**—*I.L.D.*

9.3–203 551.556.8:551.579.4

Freeman, John C., Jr., and Baer, Ledolph, **Pseudo-characteristics.** Gulf Consultants, College Station, Texas, Contract Cwb-8687 (Weather and sea studies), [Unnumbered report], **1956**(?). 7 p. fig., 3 refs. **DWB** (M551.46 F855ps)—Pseudo-characteristics are lines along which the dependent variables in non-homogeneous equations have the same relationships as the similar variables in the corresponding homogeneous equations. A sample computation of water levels due to wind stresses, using the pseudo-characteristics, is included. *Subject Headings:* **1. Pseudo-characteristics 2. Wind effects on water level**—*Authors' abstract.*

9.3–204 551.556.2:69

Dodge, J. Robert and Molander, E. Gordon (*both, U. S. Agri. Res. Service*), **Preventing storm wind damage to farm buildings.** *U. S. Dept. of Agriculture, Agriculture Information Bulletin*, No. 144, July **1956.** 32 p. numerous figs. **DWB** (M56.2 U581p)—Causes of farm building failure during storms with winds of hurricane velocity are analyzed and technical details of construction to prevent a great deal of such damage are presented, mostly in the form of sketches and drawings, for wood, masonry and pole construction and for bracing. It is agreed that no farm buildings can be constructed that will stand up under the direct force of a tornado but damage from near-tornado winds or hurricane winds can be greatly reduced if proper construction is provided. A map shows highest wind speeds (75 mph) recorded at many places in the U. S. *Subject Headings:* **1. Wind damage prevention 2. Building construction 3. Hurricane wind damage.**—*M.R.*

9.3–205 551.556.2

*Franken, Ernst and Kaps, Egon, **Windschutzuntersuchung Emsland 1955.** [Wind shelter investigations in Emsland, 1955.] *Germany. Deutscher Wetterdienst, Berichte*, 5(33), **1957.** 37 p. 35 figs., 19 tables, 8 refs. **DWB, DLC**—The importance of wind protection in land cultivation with special reference to the moors of Emsland is stressed. In the use of windbreaks it is necessary to know the density, height and width of the windbreaks and at what distance they must extend through a landscape. This detailed study includes the following: analysis of the penetrability of windbreaks and roughness of their upper margin; determination of the wind distribution within the range of effectiveness of various types of shelterstrip, instrumentation of wind velocity measurements, use of shelterstrips with and without wind distribution obliquely to the wind deviation and parallel to wind direction, wind protection within two closely adjoining shelterstrips, and wind protection in the case of highly unstable air, etc., use of measurements to calculate average wind intensity conditions to avoid sheltered land parcels, etc. Extensive data are presented both in tables and graphs. *Subject Headings:* **1. Windbreaks 2. Windbreak effectiveness 3. Emsland, Germany.** —*I.L.D.*

UPPER AIR WINDS

See also: **Horizontal wind components** (Dady), 9.3–140; **Free-atmos. turbulence** (Anderson), 9.3–200.

9.3–206 551.557:551.524.7

*Kochanski, Adam and Wasko, Peter E. (*both, Air Weather Service, Wash., D. C.*), **Daily wind flow at the 50- and 25-mb levels.** *American Meteorological Society, Bulletin*, 37(1):8–13, Jan. **1956.** 9 figs., table, 5 refs. **DWB, DLC**—The daily wind-flow patterns and the thermal structure in the regions of the atmosphere between 100 and 25 mb over North America were investigated. Three-day series of daily 100, 50 and 25 mb charts were drawn by using wind data and data obtained by special extrapolation methods for each of the mid-seasonal months in order to investigate the structure, movement, time continuity, etc. of the systems of these levels. Graphs and tables for extrapolation and daily maps of the 25 and 50 mb surfaces are presented. It is found that daily synoptic analyses of the 50 and 25 mb charts are possible over North America. "Space and time continuity in the pressure system can be maintained from daily charts in the 100 to 25 mb region of the atmosphere." The temperature layer rate in the stratosphere from 100 to 25 mb changes with latitude and with the temperature of its lower boundary layer. A tendency towards a layer between 35 and 10 mb exists over large areas. *Subject Headings:* **1. Upper air winds 2. Wind data 3. Stratospheric temperatures.** —*I.L.D.*

9.3–207 551.557:551.508.824

*Anderson, Albert D. (*U. S. Naval Radiological Defence Lab., Calif.*) and Hoehne, Walter E. (*Naval Research Lab., Wash., D. C.*), **Experiments using window to measure high-altitude winds.** *American Meteorological Society, Bulletin*, 37(9):454–457, Nov. **1956.** 2 figs., 2 tables, 6 refs. Also issued as *U. S. Naval Research Laboratory, NRL Report*, No. 4682, Jan. 10, **1956.** 9 p. 8 figs., 2 tables, 4 refs. **DWB**—Experiments made during June 10th and 15th,

955, at the N.R.L. Chesapeake Bay Annex (38°30′N, 76°32′W) using 3 cm radar to track strips of light metal foil (window) falling freely from airplanes or burst balloons. Six runs were made, the highest being from 74,000 ft altitude. The directions and speeds are compared with those obtained by GMD-1A tracking and by Radar (MX 137 A target) tracking. The differences do not exceed 7 kn for any level, and average differences are <3.4 kn which is less than standard error. Furthermore, the error increases after release of window, and may be mainly due to divergence in point of measurement between time of ascent of balloon and descent of window. More recent tests, using rockets to carry the window to 100–120 thousand feet, conducted by the ONR, give promise that winds up to 200,000 ft may be obtained accurately by the method outlined. (For earlier article by Warner and Bowen, see 5.2–2, Feb. 1954, *MAB*.) *Subject Headings:* **1. Metal foil (window) wind measurement 2. Upper air wind measurement.**—*M.R.*

VERTICAL MOTION

See: **Monthly Climatological Bulletin** (Australia), 9.3–147; **Stationary front region velocity** (Dogadkina), 9.3–182.

AQUEOUS VAPOR, HYDROMETEORS AND HYDROMETEOROLOGY

See: **Time series in hydrology** (Alexander), 9.3–139.

HUMIDITY

See also: **Measurement of water content** (Jírů), 9.3–103; **Weather and incidence of chocolate spot** (Hogg), 9.3–104; **Corrosion in packages** (Görling), 9.3–122; **Contemp. methods of measuring atmos. humidity** (Gol'tsman), 9.3–156; **Distribution of temp. and humidity of air** (Bultot), 9.3–191.

9.3–208 551.571.32:551.501.3

Steinhauser, F. (*Vienna*), **Das Mischungsverhältnis in Österreich als klimatologische Grösse.** [Mixing ratio conditions in Austria as a climatological value.] *Wetter und Leben*, Vienna, 8(8/11):196–200, 1956. 4 tables, 2 refs. **DLC**—In order to determine the climatological value or the secular mean of the mixing ratio in Austria and its variation, the author has calculated, for a series of stations in Austria, the calculated secular means of mixing ratio from the monthly means of atmospheric pressure and vapor pressure. Tables are presented containing the calculated values of the mean monthly (50 year mean) mixing ratio (g/kg) for each of 16 stations in Austria (mean monthly mixing ratio as a function of elevation above sea level, and extreme monthly mean of mixing ratio); and annual variations of vapor pressure for each of the stations. *Subject Headings:* 1. **Mixing ratio 2 Annual vapor pressure variations 3. Austria.**—*I.L.D.*

EVAPORATION AND EVAPOTRANSPIRATION.

See also: **Comparison of methods determ. evap.** (Konstantinov), 9.3–142; **Calcul. evap. from water surface** (Laĭkhtman), 9.3–143; **Calcul. monthly means areal evap.** (Uhlig), 9.3–144; **Total evap. and transpir. measurement** (Konstantinov), 9.3–157; **Natural evap. measurement** (McIlroy), 9.3–158; **Invest. methods for obs. soil evap.** (Pushkarev), 9.3–159.

9.3–209 551.573

*Deij, L. J. L.; Hooghoudt, S. B.; Latour, J. H. M.; Pearlkamp, P. K. and Stam, A. H., **Het verdampingsonderzoek in de Rottegatspolder, gedurende de jaren 1947 tot en met 1952.** [Evaporation research in the Rottegatspolder, 1947–1952.] (In: Nederlandse Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek. Commissie voor Hydrologisch Onderzoek, **Verslagen technische bijeenkomsten 7–10 en Verslag inzake het verdampingsonderzoek in de Rottegatspolder 1947–1952.** pub. 'S-Gravenhage, 1955. p. 209–

254. 9 figs., 9 tables, 4 refs., 18 eqs. English summary p. 275–276; French summary p. 298–299.) **DWB**—This comprehensive report includes the following: a detailed description of various procedures for investigating evaporation from the polder, mainly the method of vertical water vapor transport; the method of water balance for an entire polder and the method of water balance for four drainage lysimeters. The procedures and the equations relevant to each method, and measured and calculated data on evaporation are presented. The results of the four methods are evaluated. *Subject Headings:* **1. Evaporation measurement 2. Evaporation research 3. Netherlands.**—*I.L.D.*

9.3–210 551.573:581.11

*Drinkwater, W. O. and Janes, B. E. (*both, Univ. of Connecticut*), **Relation of potential evapotranspiration to environment and kind of plant.** *American Geophysical Union, Transactions*, 38(4):524–528, Aug. **1957.** 2 figs., 2 tables, 20 refs. **DWB, DLC**—The purpose of this investigation was to establish relationships between potential evapotranspiration and several elements of weather, potential evapotranspiration as influenced by the surroundings and irrigation of the surroundings, and potential evapotranspiration of Kentucky bluegrass, sweet corn and celery. High correlations were found between measured potential evapotranspiration (PE) of bluegrass and open-pan evaporation, atmometer evaporation, average temperature, solar radiation, and duration of sunshine when data were grouped into between-rain periods. When the same data were grouped into seven-day periods, relatively low correlations were obtained. Uniform surroundings, watered daily, were found to reduce measured PE of bluegrass 23.2% below bluegrass in non-uniform surroundings which were not watered. Measured PE exceeded evapotranspiration computed by the Thornthwaite empirical formula by 10 to 70% and appeared more closely associated with amount of rainfall than with mean temperature. Water use by sweet corn was found to be 22.2% higher than use by bluegrass. Although the surrounding area of celery was watered each day, PE was 11.0% greater than that of bluegrass, the surrounding area of which was not watered. When compared with PE of bluegrass which received daily irrigation of surroundings, water use by celery was 36.8% greater. *Subject Headings:* **1. Potential evapotranspiration 2. Evapotranspiration-crop relationships.**—*Authors' abstract.*

9.3–211 551.573

Green, F. H. W., **A year's observations of potential evapotranspiration in Rothiemurchus.** *Institution of Water Engineers, Journal*, 10(5):411–419, Aug. **1956.** figs., tables, 5 refs. **DLC**—A special lysimeter-like evapotranspiration gage was used in 1955 [at Achnagoichan Cottage in Rothiemurchus in the Cairngorms Nature Reserve (57°9′N, 3°49′W, elevation 1000 ft) in Scotland] to determine the daily and monthly water budget. The gage is described and illustrated in detail and the methods of measurement discussed. Observed and estimated (after PENMAN, and THORNTHWAITE, respectively) evapotranspiration are compared and the actual evapotranspiration as calculated, the precip. storage in ground water deficiency and water surplus given for each month of 1955 and for each day from Aug. 18–28 and Nov. 17–23, 1955. A source of error may have been failure to consider wind. The year 1955 was very dry, giving a wide range of conditions to comment on (Feb. and March had a water surplus). *Subject Headings:* **1. Evapotranspiration data 2. Evapotranspirometers 3. Cairngorms, Scotland.**—*M.R.*

9.3–212 551.573:551.481(794)

Rohwer, Carl; Cochrane, N. J. and Blaney, Harry F., **Discussion of [Blaney's] "Evaporation from and stabilization of Salton sea water surface."** *American Geophysical Union, Transactions*, 37(6):786–788, Dec. **1956.** 2 tables, 5 refs., eqs. **DWB**—According to ROHWER, the Salton Sea is rising faster than it should (according to water budget calculations). This is explained on the basis of slight inaccuracies in estimation of both inflow and evaporation. Small local streams contribute large amounts of water at time of flash floods, and an error in evaporation estimates of only a few inches a year would amount to a foot or more over a period of a decade. The factor for comparing pan evaporation varies by nearly 30%, depending on which factor is used. COCHRANE estimates average evaporation from Salton Sea as 62″ per annum instead of 68.5″ per annum as given by BLANEY. BLANEY replies that the above is

rrect but also the area of the Salton Sea cannot be accurately determined, so the difference 0.4 ft (3.9 ft est. and 4.3 ft actual) in rise from 1945–53 is not significant (a single storm n raise the level 1.5 ft.). (For abstract on original article, *see* 7.3–221, March 1956, *MAB*.) *ubject Headings:* **1. Evaporation from salt lakes 2. Salton Sea, Calif.**—*M.R.*

CONDENSATION

See also: **Institute of Atmos. Physics** (Arizona. Univ.), 9.3–50.

9.3–213 551.574.1

Dessens, Henri, **L'évolution des noyaux salins.** [Evolution of saline nuclei.] *Geofisica ura e Applicata*, Milan, 36:165–166, Jan./April **1957.** 5 figs. French and English sum- aries p. 165. **DLC**—Sea salt nuclei can be analyzed by a method described in this brief ticle. If the nuclei collected on slides or wires are placed in a box (not completely sealed) r about a year, and are then examined in a dry (<70% r.h.) atmosphere, it will be found at some of the elements have recrystallized and have selectively migrated a few mm. The ops which originally formed at relative humidity of even <50% are changed to cubes and ne needles, some of which are dry and some deliquescent. It is by this method that the giant clei at Lukolela (*see* 9.2–225, Feb. 1958, *MAB*) were discovered to be non-marine in origin. uline nuclei obtained at Biarritz on Sept. 22, 1955 are shown after desiccation and again n Sept. 28, 1956 after migration. *Subject Headings:* **1. Saline nuclei migration 2. Biarritz, rance 3. Lukolela, Belgian Congo.**—*M.R.*

9.3–214 551.574:631.4

Zhuravlev, M. Z., **O kondensatsii vodianykh parov atmosfery poverkhnostnym sloem hernozema.** [Condensation of atmospheric water vapor by the surface layer of chernozem.] *ochvovedenie*, Moscow, No. 9:37–44, Sept. **1955.** 3 tables, 17 refs. **DLC**—Various Russian udies on the importance of the condensation of atmospheric water vapor at the soil surface a source of soil moisture are reviewed. On the basis of experimental observations the author nds that (1) when the humidity of the surface layer of black soil exceeds the hygroscopicity evaporates; (2) when during the daylight hours the soil layer loses enough moisture to attain groscopicity it absorbs water vapor during nocturnal cooling furthering its diffusion from e atmospheric layer near the ground and (3) in summer wheat grass the soil is heated less uring the day and is less at night than in fallow soil so that water vapor condenses less often night and there is less condensation on the surface layer than in fallow soil. *Subject Head- gs:* **1. Condensation of water vapor 2. Chernozem.**—*I.L.D.*

9.3–215 551.574.1:621.3

Condensation nuclei offer technology a new yardstick. *General Electric Review*, Sche- ctady, N. Y., 60(4):22–24, July **1957.** 3 photos. **DLC**—In connection with the work of . A. Rich and F. W. Van Luik, Jr., at General Electric's General Engineering Laboratory Schenectady, the types and properties of condensation nuclei, the mechanism of condensa- on, and various techniques of condensation nuclei measurement are discussed. Applications electrical engineering are shown. *Subject Headings:* **1. Condensation nuclei 2. Electrical ngineering.**—*G.T.*

9.3–216 551.574.41:551.508.74

Weger, Nikolaus, **Ergebnisse vergleichender Taumessungen.** [Results of comparative easurements of dew.] *Germany. Deutscher Wetterdienst, Mitteilungen*, 2(14):185–187, 955. fig. German summary p. 187. **DWB**—The measurements were carried out in 1952–54 ver bare soil in a flower garden open to the west but surrounded by trees in other directions. he methods used were as follows: the use of round porcelain dew plates, round asbestos ew plates, Kessler-Fuess dew recorder, Weise dew paper, Boss dew meter and Kopp dew eter. *Subject Headings:* **1. Dew measurements 2. Dew measuring instruments.**—*I.L.D.*

9.3–217 551.574.41:581.9

Went, F. W. (*Earhart Plant Res. Lab., Calif. Inst. of Tech.*), **Fog, mist, dew and other ources of water.** *U. S. Dept. of Agriculture, Water: the Yearbook of Agriculture*, 1955:103–109.

pub. 1955. 10 refs. **DA, DWB**—Dew can be absorbed by plant leaves even when no pe ceptible moistening of the soil occurs. Annual amount of dew could be as much as 15 but since it seldom occurs on every night in the year, about 10″ is estimated as the maximu amount available in desert areas. Work of DUVDIVANI, and of THORNTHWAITE and HOLZMA is reviewed in regard to quantitative measurement and estimation of dew. Fog and mist also important in dry areas such as the California coast. Species of plants (or trees) that u fog drip or condensation on leaves are mentioned. Even humidities as low as 85%, bu more often above 93% are favorable for moisture absorption by tree leaves or needles. Grai with needle like leaves also absorb fog condensation. *Subject Headings:* **1. Dew utilization b plants 2. Fog drip 3. Moisture absorption by plants.**—*M.R.*

FOG

See: **Sea fog, Finnish Coast** (Nurminen), 9.3–18; **Diffuse radiation calculation** (Lenoble), 9.3–188; **Ice crystals and fogs in atmos.** (Klinov), 9.3–235; **Fog drip** (Grunow), 9.3–245; **Research on propag. of visible and infrared light** (Bricard), 9.3–279.

CLOUDS

See: **Cirrus forecasting** (Stone), 9.3–21; **Cloudiness conditions assoc. with synoptic variations** (Antal), 9.3–126; **Thunderstorm forecasting** (Zak), 9.3–162; **Cloud systems and precip. processes** (Hoecker), 9.3–222; **Inhibiting layers role in release of precip.** (Nikandrova), 9.3–231.

PRECIPITATION

See also: **Precip., Kansas** (Colby et al.), 9.3–13; **Precip. data, Feather River** (Calif. Div. of Water Resources), 9.3–20; **Relationship between precip. and traffic accidents** (Magnuson), 9.3–128; **Surface precip. intensity** (Ill. State Water Survey), 9.3–145; **Sunshine duration** (Steinhauser), 9.3–186; **Raceline hydrology** (Chapman), 9.3–247; special bibliog. on **Radioactivity in atmos.**, p. 324.

9.3–218 551.577:551.3.05

Flaxman, Elliott M. and Hobba, Robert L., **Some factors affecting rates of sedimentation in the Columbia River Basin.** *American Geophysical Union, Transactions*, 36(2):293–303 April 1955. 3 figs., 4 tables, 5 refs., eqs. Also: Thomas, Harold E.; Flaxman, Elliott M. and Hobba, R. L., **Discussion [of above article].** *Ibid.*, 37(1):110–112, Feb. 1956. 3 refs **DWB, DLC**—A survey of sedimentation in 38 stockponds in the Columbia Basin (E. Washington, Oregon, and W. Idaho) made in summer and autumn 1951, showed that five factors (erodable land area, original storage capacity per sq mi of watershed, age of pond, size o watershed and precip.) account for 80% of the variation. A graph shows that average annua precip. is in straight line relationship with rate of sedimentation. Areas having 8″ precip produce $\frac{1}{3}$; and 20″—$\frac{3}{4}$ as much sediment as areas with 32″ of precip. This relationship does not hold in forested watersheds. Using rainfall intensity frequency data did not improve correlation. In discussion, THOMAS et al. point out that geology and soils of basin may be related to size of basin and hence are the important factors, and rainfall intensity is more important than annual rainfall. More data needed. *Subject Headings:* **1. Rainfall-sedimentation relationships 2. Columbia River Basin.**—*M.R.*

9.3–219 551.577(436)

Pardé, Maurice, **Un remarquable recueil des précipitations autrichiennes.** [Outstanding summary of Austrian rainfall.] *Revue de Géographie Alpine*, Grenoble, 44(2):381–388, 1956. tables, refs. **DWB**—The contents of the most ambitious climatological publications of the Austrian Meteorological Service which have appeared since 1947, **Die Schneeverhältnisse in Österreich im Zeitraum—1901–50** and **Die Niederschlägsverhaltnisse in Österreich im Zeitraum—1901–50,** 3 Vol. each (*See* 5.2–223, Feb. 1951 and 7.4–227, April 1956, *MAB*, respectively), are described and the most remarkable aspects of the relation between rainfall and

evation, and relief; and the space, time and seasonal variations and extremes, discussed with ample citations from the data contained in the tables or on the color charts (by F. STEINHAUSER). Extreme variability is noted at all seasons embraced by these records. *Subject Headings:* **1. Precipitation in Austria 2. Precipitation data summaries 3. Austria.**—*M.R.*

9.3–220 551.577:551.579

*Simo, Eduard, **Príspevok k poznaniu vzt'ahov medzi ročnými zrážkami a odtokmi v ektorých slovenských povodiach.** [Relation between annual precipitation and runoff in me river basins in Slovakia.] *Geografický Časopis*, Bratislava, 8(4):186–201, **1956.** 4 figs., tables, 8 refs., eqs. Russian and German summaries p. 200–201. **DLC**—Rainfall-runoff rrelations calculated according to A. Coutagne's formulas are presented for some two dozen ations located on various rivers in Slovakia. Calculated relationships are graphically mpared with observed values. The study is based on data covering the 20-year period 31–1950. Degree of accuracy is discussed in relation to length of observations and number stations. *Subject Headings:* **1. Rainfall-runoff relationships 2. Czechoslovakia.**—*G.T.*

9.3–221 551.577.1:551.509.317

Wagner, A. James, **Mean temperature from 1000 mb to 500 mb as a predictor of precipitation type.** Massachusetts Institute of Technology. Dept. of Meteorology Contract AF (604)-1305, Scientific Report, No. 2, May **1957.** 19 p. 6 figs., 2 tables, 2 refs. **DWB** (M77.1 M414s)—The frequency of occurrence of frozen precipitation forms relative to the requency of occurrence of non-frozen forms is determined as a function of geographical location nd of the mean temperature (or thickness) of the layer from 1000 mb to 500 mb. The results re derived from the data for a large number of stations in the United States during two winter seasons. A map of the thickness values for equal probability of occurrence of frozen nd non-frozen forms illustrates the effects of altitude and continentality. It is found that he form of the precipitation can be specified with a confidence of 75% or more when the hickness value at a station is 100 ft or more from its "equal probability" value. Some refinements of the technique are discussed. *Subject Headings:* **1. Temperature-precipitation relationships 2. Precipitation type forecasting 3. Thickness charts (500–1000 mb) 4. United States.**—*Author's abstract.*

9.3–222 551.577.11:551.576.11

Hoecker, Walter H., Jr. (*U. S. W. B., Wash., D. C.*), **Cloud systems and precipitation processes in Pacific coast storms.** *Monthly Weather Review*, Wash., D. C., 84(12):421–426, Dec. **1956.** 12 figs. (incl. photos), 10 refs. **DWB, DLC**—From the records obtained during the Weather Bureau Artificial Cloud Nucleation Project carried out in western Washington State during the winters of 1952–53 and 1953–54, it is possible to study the nature of some of the precipitation processes evident in that locality, and to form a preliminary generalized picture of certain types of cloud systems involved. Evidence is presented of natural seeding mechanisms and of the growth of hydrometeors by diffusion, coalescence, aggregation, and accretion. Typical wintertime cloud systems, and the attendant precipitation processes are illustrated. *Subject Headings:* **1. Precipitation mechanism 2. Cloud systems 3. Washington.**—*Author's abstract.*

9.3–223 551.577.2(436)

Steinhauser, F. (*Vienna*), **Die neue Niederschlagskarte von Österreich.** [A new precipitation chart of Austria.] *Wetter und Leben*, Vienna, 7(5/6):95–100, **1955.** 13 refs. **DLC, DWB**—A brief account is given of the previous precipitation maps of Austria and the data upon which they were based. The present rainfall map for Austria is based upon normals for the period 1901–1950 and is based upon totalizer data which give more reliable data for precipitation in mountain regions. The superiority of the present atlas over its predecessors, the reduction of stations to a common time interval, and the mapping of rainfall in mountainous regions are discussed. *Subject Headings:* **1. Precipitation charts 2. Austria.**—*I.L.D.*

9.3–224 551.577.2

Suzuki, E. and Tomatsu, K., **On the locality of rainfall amount, (Statistical study on the amount of precipitation, Pt. 3).** *Journal of Meteorological Research*, Tokyo, 7(5):283–289,

July 1955. 4 figs., 5 tables, 2 foot-refs., eqs. In Japanese; English summary p. 283. **DWB** In this paper, the authors examined the locality of rainfall from a statistical point of view, ar the principal results are as follows: 1) The definition of locality of rainfall was given, that i two areas with the same locality are characterized by the same probability law and all mutu positive correlation coefficients (lower confidence limit is positive). 2) Various likelihoo ratios for normalized data of monthly amount of precipitation of Kantō District in June ar July are calculated. 3) The localities of Kumagaya, Maebashi and Utsunomiya are examin by another criterion, and as a result the common locality is recognized for the above thr stations. (For Pts. 1, 2 and 4, *see* 8.1–287, 8E–37 and 7.9–202, Jan. and May 1957 and Sep 1956, *MAB*.) *Subject Headings*: **1. Precipitation amount 2. Japan.**—*Authors' abstract.*

9.3–225 551.577.3

Bruce, J. P., **Hydrometeorological analysis of the storm of August 28–30, 1956, in Ontari** *Canada*. *Meteorological Div., CIR*-2886, TEC-246, Feb. 25, **1957.** 10 p. 4 figs., 2 table 6 refs. **DLC**—A typical depth-duration-area analysis of the 3-day storm in the area to th west and north of Toronto that was experienced on Aug. 28–30, 1956, on the occasion of stationary cold front with minor waves moving across the area for the 3 days. Hydrograph of the Humber and Conestogo Rivers are presented and the rainfall-runoff relations discusse A storm isohyetal map, and mass curves of rainfall for Elmira and Guelph recording rai gages, plus Buffalo (radiosonde) stability indices are also charted. *Subject Headings:* **1. Storm rainfall 2. Rainfall-depth-duration-area studies 3. Ontario, Canada.**—*M.R.*

9.3–226 551.577.37(76, 78, 764

Frazier, Howard M. (*Extended Forecast Sec. U. S. W. B., Wash., D. C.*), **The weathe and circulation of March 1957: a month with an extensive polar block and expanded circum polar vortex.** *Monthly Weather Review*, Wash., D. C., 85(3):89–98, March **1957.** 12 figs 3 tables, 13 refs. **DWB, DLC**—In connection with this anomalous expanded circumpola vortex the drought of the south central plains (which had continued for 5 years) was broke by heavy rains—in some places over twice normal, that occurred in the Plains. Houston, Tex had 11.42″ or 8.64″ above normal—wettest March on record—as was also the case in Dodg City, Kans., and in the Pacific Northwest (Yakima and Medford). A week-by-week revie of circulation patterns and indices is presented. *Subject Headings:* **1. Record rainfall 2. Cir culation patterns 3. Great Plains 4. Houston, Texas 5. Pacific Northwest.**—*M.R.*

9.3–227 551.577.37(74/75):551.513.

§Winner, J. P. and Ross, R. B. (*both, Weather Analysis Center, U. S. W. B., Wash., D. C.*) **Synoptic features attending the heavy rains in the Middle Atlantic States and Southern New England, Oct. 13–17, 1955.** *Monthly Weather Review*, Wash., D. C., 83(10):239–247 Oct. **1955.** 9 figs., 12 refs., eq. **DWB**—The author describes the storm of Oct. 13–17, 1955 showing the features contributing to the situation and discusses some of the mechanism that produced the heavy rains. Of primary interest is the deep blocking feature that existe at the time and the deep moisture emanating from a cyclonic development off the east coas of Florida. The discussion covers a description of the surface feature and the heavy rain area, an analysis of the origin and movement of the moisture problems, of the upper air feature such as the blocking high, of the mean large-scale vertical motion, and of the warm geostrophic advection. The history of the storm is summarized by an examination of the precipitation mass curves for Washington, D. C., Allentown, Pa., Bridgeport, Conn., and Rock Island, R. I. *Subject Headings:* **1. Excessive rainfall 2. Synoptic conditions for rainfall 3. Blocking action 4. Middle Atlantic States 5. Southern New England.**—*I.L.D.*

9.3–228 551.577.38:551.577(73)

§Ludlum, David M. (*Ed. of Weatherwise*), **Drought, then some relief.** *Weatherwise*, Boston, 9(6):210–212, Dec. **1956.** 4 charts. **DWB**—Sept. and Oct. 1956 weather in the U. S. was characterized by continuing drought (commenced in March 1954) in the Great Plains, above normal temperature in the West and below normal temperature in the East in Sept., and above normal (except in the Far West) in Oct. Precipitation in Oct. was the reverse from that in Sept., breaking the drought in some areas; and heavy to moderate over most of

he U. S. Rainfall in Florida amounted to 3 to 20 in., producing floods in central Florida nd much damage to roads, bridges and crops. Winter came early in the Cascade and Rockies. *ubject Headings:* **1. Drought, Great Plains 2. Rainfall data 3. United States.**—*M.R.*

RAIN, SNOW AND HAIL

See also: **Experimental droplet impingement** (Gelder), 9.3–94; **Snow and avalanches, Swiss Alps** (Davos), 9.3–149.

9.3–229 551.578.11:546.13

Borrel, F., **Sur une méthode polarographique de dosage de l'ion Cl^- dans les eaux météoriues.** [A polarographic method of Cl^- ion sampling in rainwater.] *Journal Scientifique ie la Météorologie*, Paris, 7(26):233–239, April/June **1955.** 2 tables, 3 refs. French, English nd Spanish summaries p. 233. **DWB**—Details of a polarographic method of determining, o an accuracy of 2%, the amount of Cl^- ion in rainwater, using samples of 300 cc having no ess than 0.1 mg of Cl^-, are set forth systematically. The method makes use of an excess of Ag^+, neutralized by CrO^4. Samples are prepared during concentration by using NaOH and CH^3COOH to make up for abundance of other ions in rainwater (SO^4, CO^3, Na, K, NH^4, Ca, Mg and NO^3) if present in smaller quantities than the Cl^-. *Subject Headings:* **1. Rainwater nalysis 2. Chemical analysis of rainwater 3. Chlorinity of rainwater.**—*M.R.*

9.3–230 551.578.11:551.501:629.13

*Brun, Rinaldo J.; Gallagher, Helen M. and Vogt, Dorothea E., **Impingement of water roplets on NACA 65A004 airfoil at 8° angle of attack.** *U. S. National Advisory Committee or Aeronautics, Technical Note*, 3155, July **1954.** 27 p. 8 figs., 6 eqs., 6 refs. **DWB**—The rajectories of droplets in the air flowing past an NACA 65A004 airfoil at an angle of attack f 8° were determined. The amount of water in droplet form impinging on the airfoil, the rea of droplet impingement, and the rate of droplet impingement per unit area on the airfoil urface were calculated from the trajectories and presented to cover a large range of flight nd atmospheric conditions. These impingement characteristics are compared briefly with hose previously reported for the same airfoil at an angle of attack of 4°. (*See* 5.8–23, Aug. 954, *MAB.*) *Subject Headings:* **1. Drop impingement on airfoil 2. Impingement of drops . Drop impingement measurement.**—*NACA abstract.*

9.3–231 551.578.11:551.576.11

Nikandrova, G. T. and Chuvaev, A. P., **O roli zaderzhivaiushchikh sloev v razreshenii sadkov.** [Role of inhibiting layers in the release of precipitation.] *Meteorologiia i Gidroologiia*, No. 4:12–18, April **1956.** 2 figs., table, 7 refs. **DWB, DLC**—The release of rainfall rom water clouds which do not show extensive vertical development and which are below he freezing level, requires a condition of colloidal instability which favors the appearance of a urge number of drops and their release from the clouds. The presence of an inhibiting layer n the clouds favors the development of large numbers of drops. In this paper the author escribes several examples, illustrating the development of large numbers of drops at the level f the inhibiting layer in cumulus clouds and summarizes a number of studies which describe he fall of raindrops from purely aqueous clouds (in tropical regions). A table giving the me in seconds for the condensational growth of droplets as a function of distribution and emperature is given. *Subject Headings:* **1. Raindrop size distribution 2. Raindrop observaon in clouds 3. Drop formation.**—*I.L.D.*

9.3–232 551.578.4

Butkovich, T. R., **Strength studies of high-density snow.** *U. S. Snow, Ice and Permaost Research Establishment, Research Report*, No. 18, Oct. **1956.** 19 p. 17 figs. (incl. photos), 1 tables, 15 refs. **DLC**—Various strength properties of naturally compacted high-density nows, in the density range from 0.40 to 0.75 g/cm³ are reported. Test results are given for: onconfined compression; unconfined and confined double shear; ring, flexural, and centrifugal ensile strength; torsional shear; and work of disaggregation. The expression

$$S = a(\gamma - \gamma_0)[1 + b(\gamma - \gamma_0)^2]$$

lating the various strengths (S) to the density (γ) of snow fits all the results. The constants

a and b are different for each test, while γ_0 is constant for all tests. The work of disaggregation per unit volume was related to crushing, tensile, and shear strength at various lateral pressures using the same empirical relationship. The results of the various tests measuring the tensile strength of the snow compare favorably with each other. An attempt was made to use the direct shear strength results in Coulomb's equation for the determination of Mohr's envelope of rupture for snow. These tests yield higher values than those obtained in unconfined compression tests. However, angles of internal friction obtained considering MOHR's envelope to be a straight line seem to agree with measurements taken on an unconfined compression specimen. *Subject Headings:* **1. Snow strength 2. Snow shear strength.**—*Author's abstract.*

9.3–233 551.578.4

Vitásek, František, **Sněžná čára ve Vysokých Tatrách.** [Snow line in the High Tatra Mountains.] *Geografický Časopis*, Bratislava, 8(4):171–176, **1956.** table, 17 refs. Russian and German summaries p. 175–176. **DLC**—The snow line in the High Tatra Mountains has been put between 1940 and 2600 m by various authors. Some of the discrepancies result from the different definitions of snow line (orographic, actual, or climatic snow line), others from the difference in the methods used (visual observation, latitudinal interpolation, temperature data, etc.). It should also be borne in mind that considerable climatic changes occurred since the estimates of the authors reviewed were made (evidence of warming and of glacier regression since the last century is given). The climatic snow line (chionosphere) over the Tatra Mountains is around 2400 m; the actual snow line is at 2300 m. Below that altitude there are isolated snow fields favored by orography. Since only steep rocky slopes and peaks reach over 2300 m, on which firn and snow cannot maintain itself, no region of permanent snow has developed in the Tatra Mountains. *Subject Headings:* **1. Snow line 2. Tatra Mountains, Czechoslovakia.**—*G.T.*

9.3–234 551.578.41

Evstratov, F. A. and Karuskevich, E. N., **Krivaia obespechennosti zapasov vody v snege na otkrytoĭ mestnosti po dannym marshrutnykh snegomernykh s"emok v basseĭne r. Devitsy.** [Curve of water content of snow in open terrain according to snow survey data in the Devitsa River basin.] *Meteorologiia i Gidrologiia*, Leningrad, No. 1:45–47, Jan. **1956.** fig., 2 tables, ref. **DWB, DLC**—The authors describe the physical geography of the river basin from the snow survey data and present the curves of water content of snow in open terrain for 1949 to 1954 and the data utilized in constructing these curves. *Subject Headings:* **1. Water content of snow 2. Devitsa River Basin, U.S.S.R.**—*I.L.D.*

9.3–235 551.578.41:551.575.1

Klinov, F. Ia., **Ledianye kristally i ledianye tumany v atmosfere.** [Ice crystals and ice fogs in the atmosphere.] *Priroda*, Moscow, 46(2):83–86, Feb. **1957.** 4 figs., 2 tables. **DLC**—Microphotographs and schematic drawings of ice crystals collected near the ground and in the free atmosphere under extreme conditions (−35 to −58°C) near the Cold Pole of the earth, are shown and discussed. Structure of ice fog particles is shown. *Subject Headings:* **1. Ice crystals 2. Ice fog 3. Verkhoiansk, Siberia.**—*A.A.*

9.3–236 551.578.41

Radok, Uwe (*Met. Dept. Univ. Melbourne*), **Note on the free water content of Australian snow.** *Australian Meteorological Magazine*, Melbourne, No. 12:72–77, March **1956.** 2 figs., 4 refs. **DWB, DLC**—Two methods of determining the free water content of snow, as applied or to be applied in the Australian Alps, are reviewed. These estimates are used in predicting water supply from snow during May–Nov. (winter). It is safely assumed that in most cases the temperature of the entire snowdeck is close to 32°F, since water percolates through the deck and is held in a state of suspension until melting occurs with only thin crusts of frozen snow on top. Hot water calorimetry (BERNARD and WILSON, 1941) was used by the author to determine free water content at 5600 ft near Mt. Hotham, Victoria in Sept. 1955. Snow amounts were determined by volume rather than weight (accurate to nearest gram or cc of water). Results of free water vs. weight of snow are plotted for all observations and free

ater against time of day are plotted. Further tests will be made to determine local and easonal variations. *Subject Headings:* **1. Water content of snow 2. Water supply forecasting 3. Mt. Hotham, Victoria.**—*M.R.*

9.3–237 551.578.41

Schaefer, Vincent J. (*Munitalp Foundation, Inc.*), **The preparation of snow crystal replicas (Simple experiments in atmospheric physics, Pt. 6).** *Weatherwise*, Boston, 9(4):132–146, ug. 1956. 3 photos. **DWB**—Details of techniques worked out by the author for preparing eplicas (on slides) of snow crystals formed in the laboratory or in nature. The plastic replicas re made of polyvinyl formal dissolved in ethylene dichloride (which evaporates). No damage done to the most delicate of snow crystals and the structure is preserved indefinitely if made at temperatures of −5° to −20°C. *Subject Heading:* **1. Snow crystal replicas.**—*M.R.*

9.3–238 551.578.43:551.555.6

Ludlum, David M., **Some notable snows of the winter 1955–56.** *Weatherwise*, Boston, 0(1):26–28, Feb. **1957.** photo. **DWB, DLC**—Several record snowfalls or snow spells uring 1955–6 are recounted. First the Nov. 1955 and Nov. 1956 storms around and south of uffalo; then the Dakota blizzards of Nov.–Dec. 1955; the Texas Panhandle blizzard of Feb. –5, 1956; the snowiest March on record in New England since 1871 (Sydney, N. S., had 58″) nvolving 4 separate snowstorms—all of record depth for late March. Norfolk, Conn., at 380′ elev had 177.4″ breaking Connecticut's all-time record of 133.4″. Mt. Rainier, Wash. Paradise R.S. at 5500′) had 1000.3″ breaking Tamarack, Calif., record of 884″ in 1911. *ubject Headings:* **1. Record snowfalls, U. S. (1955–6) 2. Snowfall extremes 3. United tates.**—*M.R.*

9.3–239 551.578.45(764,789)

Brown, H. E. and Brintzenhofe, R. A. (*both, Natl. Weather Analysis Center, U. S. W. B., Wash., D. C.*), **Snowstorm of Feb. 1–5, 1956, in New Mexico and Texas.** *Monthly Weather Review*, Wash., D. C., 84(2):75–85, Feb. **1956.** 16 figs., table, 17 refs. **DWB, DLC**—A rare nowstorm and blizzard moved across New Mexico on Feb. 1–3, 1956 becoming stationary ver S.E. New Mex. and N.W. Texas on Feb. 3–5, 1956. The storm broke all records for 0 years and resulted in 18 deaths and complete paralysis of traffic. The storm was produced y a cold low aloft, which nearly reached the ground on Feb. 4. Air trajectories, precipitable ater and stability calculations indicate rather dry air with little convective activity and flow f moisture from the east at <7000 ft. The great amount of snow was due to continuity ot intensity of fall, of a stable air mass with a constant supply of moisture and upslope motion ue to the cold low aloft. No available method of forecasting (even numerical) could have ccurately predicted this snow cover. *Subject Headings:* **1. Record snowstorms 2. Snowtorms, New Mexico (Feb. 1956) 3. Snowstorms, Texas (Feb. 1956) 4. New Mexico . Texas.**—*M.R.*

9.3–240 551.578.45:551.515.13

§Mook, Conrad P. and Norquest, Kenneth S. (*both, U. S. W. B. Forecast Center, Washington National Airport, Wash., D. C.*), **The heavy snowstorm of March 18–19, 1956; the climax f a record late-season snow accumulation in Southern New England.** *Monthly Weather Review*, Wash., D. C., 84(3):116–125, March **1956.** 8 figs., 11 refs., eqs. **DWB, DLC**—The uthors analyze the meteorological conditions leading up to and associated with the record breaking snowfalls of March 18 and 19, 1956 along the northeastern coast of the United States. /ith the aid of synoptic maps they consider the antecedent conditions, the characteristics of he snowstorms, the cyclonic tracks associated with the storms and the relationship between outhward development and thickness patterns. The roles of high-level divergence and low evel temperature advection on the intensification of the cyclone are compared and the possible ole of low level instability in the abundant snow fall is considered. These snowstorms are ompared with the heavy snowstorms (more than 11 in.) that occurred during Jan., Feb. and larch (1899–1939). *Subject Headings:* **1. Record snowfalls 2. Snowstorms, New England March 1956) 3. Synoptic conditions for snowstorms 4. Cyclone tracks 5. New England.** *-I.L.D.*

9.3–241 551.578.46

Briedóň, Vojtech, **Snehové pomery povodia Oravskej priehrady z vodohospodárskeho hl'adiska.** [Snow conditions in the catchment area above the Orava Dam from the hydrological viewpoint.] *Vodohospodársky Časopis*, Bratislava, 4(4):254–269, **1956.** 2 figs., 6 tables, 10 refs. Russian and German summaries p. 268–269. **DLC**—Snow-cover conditions in the Orava River Basin (Slovakia) are described in detail on the basis of observations at 10 locations from 1921–1951. Data on the depth, density, and water equivalent are also mapped. Continuous snow lasts in the area from Dec.–March with maximum water equivalent in Feb.–March, when it varies for individual regions from 65.5–165.6 mm. The effects of elevation on the distribution and density of snow cover, as studied in the spring 1956, are discussed, and data on variations of snow depth and density are tabulated. *Subject Headings:* **1. Snow cover distribution 2. Snow cover density 3. Snow cover depth 4. Orava River Basin, Czechoslovakia.**—*SIPRE abstract.*

9.3–242 551.578.7

Maier, Wilhelm, **Hagelsteine und Achsenlage von Gewitterwirbeln.** [Hailstones and axis position of thunderstorm eddies.] *Meteorologische Rundschau*, 10(2):58–62, March/April **1957.** 8 figs., 9 refs. **DWB**—Apple-shaped hailstones 3 cm in diameter fell at Chiemgau on July 29, 1956, and were examined microscopically in thin slices. They were attributed to rotation about a horizontal axis. They were reproduced in a centrifuge by rotating glass balls covered by paraffin dust or liquid paraffin. The distribution of graupel and hail apples on July 29 is mapped. *Subject Headings:* **1. Hailstones 2. Chiemgau, Germany.**—*C.E.P.B.*

9.3–243 551.578.73

Katsnelson, J. (*Met. Ser., Tel Aviv*), **On the occurrence of hail in Israel.** *Israel. Meteorological Service, Ser. D., Contributions* No. 6. table. Also issued as: *Research Council of Israel, Bulletin*, 4(4), March **1955. DLC**—Hail data are too sporadic to make any regional study of hail in Israel, but data for Lod Airport, in the center of the Coastal Plain, for 1945–7 and 1950–4 shows a maximum of cases and of days with hail in Dec.–Feb. and none from May to Oct. Size distribution does not coincide with frequency distribution, the largest stones falling in Oct. and May (1937 and 1944). No diurnal variation can be detected in the data available. *Subject Headings:* **1. Hail frequencies in Israel 2. Lod Airport, Israel.**—*M.R.*

9.3–244 551.578.73

†*Zinkiewicz, Włodzimiera and Michan, Edward, **Częstotliwość występowanie grádow w województwie lubelskim w zalezności od warunków fizjograficznych.** [Frequency of hail in the Lublin Department in relation to the physiographical conditions.] *Lublin. Uniwersytet Marii Curie-Skłodowskiej, Rocznik, Ser. B*, 10:223–300, **1955.** 11 figs. (2 fold), 29 tables, 60 refs. Russian and German summaries p. 288–300. **DWB**—An elaborate and detailed statistical study of hail frequencies and paths in various parts of the Lublin district of Poland, based on observations (2257 cases) for 5 years (1946–50). Regional, seasonal, diurnal and elevation variations are clearly brought out in tables, graphs and charts. Almost 90% of the cases of hail occurred from 12h–24h, and all occur from April–Sept. (maximum—Aug.). Size of hailstones, weight per m^2, causes (orographic and meteorological) etc., are given. The greatest frequency is on the high plains—at even higher elevations the forests may decrease the convective activity and reduce hail frequency. Specific cases in 1948 and 1950 are analyzed in detail and charted. *Subject Headings:* **1. Hailstorm analysis 2. Hail frequencies 3. Lublin Region, Poland.**—*M.R.*

9.3–245 551.578.9:551.575

Grunow, J. (*Met. Obs., Hohenpeissenberg*), **Erfassung zusätzlicher Niederschlagsmessungen am Waldboden aus Nebelablagerungen.** [Measurement of additional precipitation from fog deposits on forest soil.] *Wetter und Leben*, Vienna, 7(8/11):262–263, **1955. DLC**—Studies carried out on the slopes of the Hohenpeissenberg indicate that the precipitation amount can be measured many fold by "fog dripping" from rime deposits on trees reaching the forest bed during winter. Data on the significance of this additional precipitation in the

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total precipitation at the higher levels of the Hohenpeissenberg are given. *Subject Headings:* **1. Fog drip 2. Precipitation amount 3. Annual precipitation 4. Hohenpeissenberg, Austria.** —*I.L.D.*

HYDROMETEOROLOGY

See also: **Storm precip.** (U. S. Corp. of Engrs.), 9.3–14; **Assoc. of Scientific Hydrol.** (IUGG), 9.3–64; **Moisture availability for spring wheat** (Verigo), 9.3–112; **Effect on stream flow** (Love), 9.3–118; **Invest. methods for obs. soil evap.** (Pushkarev), 9.3–159; **Seasonal runoff forecasting** (Ford), 9.3–161; **Parameters assoc. with flood rains** (Means), 9.3–163; **Pseudocharacteristics** (Freeman), 9.3–203; **Annual precip. and runoff relationship** (Simo), 9.3–220.

9.3–246 551.579:551.588.6

Armand, D. L., **Zakonomernosti pogloshcheniia livnevogo stoka v lesnykh polosakh.** [Laws of absorption of storm rain runoff in forest belts.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geog.*, No. 2:13–32, **1957.** 15 figs., 2 tables, 17 refs., 28 eqs. **DWB**—A comprehensive scheme for calculating storm runoff is presented and explained in detail for the purpose of determining the optimum width of forest belts, on the basis of regional and geographical influences on runoff, and the consideration of the variability of natural factors (soil type, cover, slope, etc.) determining the process. Many empirical-theoretical curves and hydrographs are included and their use illustrated. *Subject Headings:* **1. Runoff 2. Forest influences on runoff.**—*A.M.P.*

9.3–247 551.579:551.577

*Chapman, R. G., **Hydrological aspects of racelines as applied to a hydroelectric project.** *Institution of Engineers (of) Australia, Sydney, Journal*, 26(9):203–207, Sept. **1954.** 4 figs., 3 tables. **DLC**—Racelines are proposed for concentrating the runoff from the small valleys in the heavy rainfall areas (100″/yr or more) on the windward (NW and N) slopes of the Bogong High Plains (5300–6200′ elev.) of eastern Victoria. In order to estimate the hydroelectric potential, rainfall records extending back 70 years are analyzed and compared with runoff records. Automatic streamflow records date back to 1926. A graph shows definite relation between rainfall and altitude for three aspects: windward, plateau and leeward stations. The rain shadow produces 30–40″ less rain on leeward than on windward slopes. Average flow and raceline pickup on the High Plains must be calculated with consideration of snowdrifts as well as precip. patterns. On the windward slopes, enough data are available to make good areal estimates. *Subject Headings:* **1. Raceline hydrology 2. Rainfall-runoff relationships 4. Bogong High Plains, Victoria.**—*M.R.*

9.3–248 551.579

Czepa, Otto, **Über den Wasserhaushalt der Atmosphäre.** [On the water economy of the atmosphere.] *Forschungen und Fortschritte*, 31(5):129–133, May **1957.** 21 refs., 8 eqs. **DLC**—Equations of water balance over continents and oceans are developed. Precipitation over land is put at 112.10^3 km³/yr and runoff at 37.10^3, so that 67% of land rainfall is derived from evaporation over land. Rainfall over sea is not known directly but evaporation can be calculated from zonal radiation; rainfall is evaporation minus runoff. Regional and zonal balances are discussed in terms of advection and ascent of moist air. The subtropical highs with an evaporation excess of 1000 mm/yr or more are the chief source of continental rainfall. Finally, annual variations are considered. *Subject Heading:* **1. Hydrologic cycle.**—*C.E.P.B.*

9.3–249 551.579:628.1

†Dixey, Frank (*Colonial Geological Surveys, London*), **Variability and predictability of water supply.** (In: White, Gilbert F. (*ed.*), **The future of arid land.** Wash., D. C. American Association for the Advancement of Science, **1956.** p. 121–140. 28+12 refs.) **DLC**—This paper deals with the variability and predictability of the water supply in some of the arid parts of various British Overseas Territories and Commonwealth countries mainly in Africa; namely, Kenya, Aden, Bechuanaland, Tanganyika, South Africa, etc. The discussion includes the following: climatic variations, the search for water in arid lands, well-water, the

quality of water, the use of surface water, recharge of aquifers and an outline of the water situation in British Overseas and Commonwealth territories. *Subject Headings:* **1. Water supply survey 2. Arid zones 3. South Africa.**—*I.L.D.*

9.3–250 551.579:628.1

Increased demands for water worry U. S. experts. *American Meteorological Society, Bulletin*, 37(3):93, March **1956. DWB**—A summary is given of the increasing amounts of water required by expanding industry and rising population and an outline of various methods for extending present supplies of water. *Subject Heading:* **1. Water supply.**—*I.L.D.*

9.3–251 551.579:519.241.1

Potter, W. D., **The effect of nonrepresentative sampling on linear regressions as applied to runoff.** *American Geophysical Union, Transactions*, 38(3):333–340, June **1957.** 3 figs., 5 tables, 5 refs., eqs. **DWB, DLC**—Relations between peak rates of runoff and four rainfall and topographic indices are determined by linear multiple regressions for eight samples of gaged watersheds in the Allegheny-Cumberland Plateau. Three of these samples are representative and five are non-representative as to watershed location and size. Precision of the eight regression equations in estimating peak rates of runoff is shown to be materially affected by the representativeness of the sample from which the equation was derived, decreasing rapidly as the degree of sample nonrepresentativeness is increased. It is concluded that the precision of such an equation as an estimator depends more on the representativeness of the sample than it does on the sample size. *Subject Headings:* **1. Runoff estimation 2. Multiple regression techniques 3. Rainfall index 4. Allegheny-Cumberland Plateau.**—*Author's abstract.*

9.3–252 551.579.2

Salamin, Pál, **A hóolvadásból származó belvízmennyiségek.** [Amount of standing water from snow melt.] *Hungary. Vízgazdasági Tudományos Kutató Intézet, Vízügyi Közlemények*, No. 3:329–346, **1956.** French and German summaries p. (75)–(80). **DWB**—The general theory of calculating the amount of standing water (melting rate less runoff) is outlined. The melting rate is determined by heat and water balance calculations in which such meteorological elements as atmospheric humidity, solar radiation, temperature, wind and precipitation are considered. The runoff coefficient is determined as a function of preceding precipitation, amount of melt water (including rain water) and soil freezing. A nomogram is presented, showing the relationships of these factors—except soil freezing, whose effect has to be estimated. *Subject Headings:* **1. Snow melt computation 2. Snow melting rate 3. Runoff 4. Snow melt nomograms.**—*G.T.*

9.3–253 551.579.4:551.311.1

Károlyi, Zoltán, **A dunai árvizek természeti okai és elhárításuk lehetősége.** [Natural causes of Danube floods and their possible prevention.] *Természet és Társadalom*, Budapest, 115(4):225–229, April **1956.** photos, diagrs. **DLC**—This paper contains a general discussion of the causes of ice-free floods (precipitation, runoff conditions, snow melt rate, etc.) and of ice floods (ice accumulation, melting rate, etc.); a table of record water levels at eleven Danube stations in Hungary; a table of ice cover duration during the last 70 years and circumstances of the breaking; description of the ice flood of 1956 and, finally, means of protection from ice floods. *Subject Headings:* **1. Floods 2. Ice melt floods 3. Ice accumulation 4. Danube River.**—*G.T.*

9.3–254 541.12:551.579.4:551.482

Voronkov, P. P., **O gidrokhimicheskom sposobe opredeleniia podzemnoĭ sostavliaiushcheĭ rechnogo stoka.** [Hydrochemical method for determining underground component of river flow.] *Meteorologiia i Gidrologiia*, Leningrad, No. 5:40–44, Sept./Oct. **1955.** 5 refs., 3 eqs. **DWB, DLC**—The two-term scheme of subdividing river water into waters of surface and underground origin and the chemical constitution of river water as proposed by A. T. Ivanov and A. I. Salin-Bekchurin are critically examined. It is maintained that these authors do not attach any significance to the difference in the hydrochemical processes of mixing of

water streams and the formation of the chemical constitution of the water of the channel. *Subject Headings:* **1. Chemical content of rivers 2. Chemical content of underground waters.** —*I.L.D.*

9.3–255 551.579.5:551.501

Konček, Mikuláš, **Podrobná mapa indexu zavlaženia v ČSR.** [Detailed map of moisture index for Czechoslovakia.] *Meteorologické Zprávy*, Prague, 10(1):27–28, **1957.** map, eqs. **DWB**—In an earlier article (8.1–304, Jan. 1957, *MAB*), the author developed a soil moisture index (based on precipitation, temperature and wind speed) and applied it to Czechoslovakia, presenting a map of average soil moisture index for the growing season, based on data for over 100 stations. In this paper a more accurate map is presented with the addition of some 60 more stations. *Subject Headings:* **1. Moisture index 2. Soil moisture measurement.**—*G.T.*

CLIMATOLOGY AND BIOCLIMATOLOGY

CLIMATOLOGY

See: **Antarctica-recent progress in exploration** (Riccardi), 9.3–47; **Climatological services of U. S. W. B.** (U. S. W. B.), 9.3–53; **Voeĭkov's work in climatology** (Davitaia), 9.3–62; **Climatic description of agricultural production** (Gol'tsberg), 9.3–111; **Quaternary history and British flora** (Godwin), 9.3–266.

CLIMATE OF PARTICULAR PLACES

See also: **Climate, eastern Andean slopes, Central Peru,** (Drewes, Drewes), 9.3–17; **Soils of equatorial regions, Netherlands East Indies** (Mohr), 9.3–23; **Bibliog. on climate of Greenland** (Bender), 9.3–65; **Climatic info. sources for Greenland** (Hastings), 9.3–66; **Bibliog. on climate of Guianas** (Roman), 9.3–67; **Bibliog. on climate of Turkey** (Peterson), 9.3–68; **Bibliog. on climate of Iran** (Peterson), 9.3–69; **Summary of en route weather** (Cronin), 9.3–102; **Climate, Basel** (Bider), 9.3–285.

9.3–256 551.582.1(87)

Crist, Raymond E. (*Univ. of Fla., Gainesville*), **Along the Llanos-Andes border in Venezuela: then and now.** *Geographical Review*, New York, 46(2):187–208, April **1956.** 12 figs. (incl. photos), 8 refs. **DWB, DLC**—A qualitative description of the climate of the southeastern flank of the Venezuelan Andes is presented. The region enjoys a savanna climate with distinct wet and dry seasons. The seasonal variation of wind, rainfall, insolation and weather is described briefly. *Subject Headings:* **1. Climate of Llanos-Andes area, Venezuela 2. Southeast Venezuela.**—*I.L.D.*

9.3–257 551.582.1(786)

*Gieseker, L. F., **Soils of McCone County: soil reconnaissance of Montana, preliminary report.** *Montana, Agricultural Experiment Station, Bozeman, Bulletin*, No. 514, Oct. **1955.** 62 p. 4 tables, 4 maps (fold.) in pocket. **DWB**—Temp., precip. and wind are discussed and tables of monthly data presented (on p. 17–20). Circle, Poplar and Sentinal Butte in McCone County in N.E. Montana are used as representative stations. *Subject Headings:* **1. Climate of McCone County, Mont. 2. McCone County, Mont.**—*M.R.*

9.3–258 551.582.1(85)

Valdivia Ponce, Jorge, **Estudio climatológico de Puerto Chicama.** [Climatological study of Puerto Chicama.] *Compañía Administradora del Guano, Lima, Boletín Científico*, 2:5–23, **1955.** 14 figs. (some fold.), table, 5 refs. **DWB**—The climate of Puerto Chicama (07°41'S; 79°26'W) is intermediate between marine and continental and changes in ocean temperature influence air temperature and ultimately atmospheric pressure and weather. The author describes the situation of the locality and with aid of graphs and tables discusses the characteristics and variations of sea temperature, air temperature, atmospheric pressure, wind frequency

and velocity, and thermal differences between air and sea as a factor determining cloud formations. *Subject Headings:* **1. Climate of Puerto Chicama 2. Climatic studies 3. Puerto Chicama, Peru.**—*I.L.D.*

9.3–259 551.582.1(497.1)

†Vrišer, Igor, **Goriška Brda: Gospodarska geografija.** [Economic geography of Goriška Brda.] *Geografski Zbornik*, Ljubljana, 2:51–114, **1954.** 18 figs., tables, 111 refs. (1 fold map). English summary p. 110–113. **DLC**—Some information on the climate of Goriška Brda, a hilly region rising on the border between the alluvial Friulic plain and the Karstic plateau of Banjsčile, are included in this paper. A mild Mediterranean climate prevails only in the lowest, southern part of the region where the annual mean temperature is 12.8°C (July average 22.9°C, Jan. average 2.9°C). Towards the interior in central and upper Brda the influence of the Central European climate is more pronounced, with especially strong and cold winds, called "buria." Quick changes of temperature causing damage to orchards and vineyards are frequent. Great summer heat with scarce rainfall and frequent hail storms are the characteristic features of central and upper Brda climate. *Subject Headings:* **1. Climate of Goriška Brda 2. Goriška Brda, Yugoslavia.**—*From author's abstract.*

9.3–260 551,582.2(672)

*Mouton, J., **Étude climatologique sur la Vallée du Niari (Moyen-Congo).** [Climatological study of the Niari Valley, Middle Congo.] *La Météorologie*, Paris, Ser. 4, No. 43:259–265, July/Sept. **1956.** figs., 3 tables, 5 refs. French, English and Spanish summaries p. 259. **DWB**—Available rainfall, sunshine, vapor pressure, evaporation, relative humidity, temperature and wind data for one or more stations in the Niari Valley of French Equatorial Africa are analyzed statistically and discussed with respect to the agricultural year and seasonal limits of crop growth. The region constitutes a narrow band of low rainfall (<1500 mm) bordering a region of heavy rainfall in the Congo. Artificial rainfall experiments in Dec. 1954 are mentioned. *Subject Headings:* **1. Climate of Niari Valley 2. Climatic studies 3. Niari Valley, French Equatorial Africa.**—*M.R.*

9.3–261 551.582.2(728)

*Wiley, Selva C.; Dodd, Arthur V. and Chambers, Jack V., **Environmental handbook of Fort Sherman and Fort Gulick, Panama Canal Zone.** *U. S. Quartermaster Corps. Research and Development Command. Environmental Protection Division, Technical Report*, EP-17, July **1955.** 50 p. 40 figs. (incl. photos), 4 tables, 19 refs. **DWB**—The climatic summary contains mean monthly values of temperature, precipitation, relative humidity, wind velocity and cloudiness presented in tables for San Cristobal, Canal Zone. Frequencies of the various meteorological variables, the precipitation regime, sunshine amount and solar radiation at Fort Sherman, Canal Zone and percentage occurrence of wind speeds by groups are presented graphically. Also, a description of the surface terrain, drainage and vegetation are given. Maps and photographs are included. *Subject Headings:* **1. Climatic summaries 2. Climate of Cristobol, Canal Zone 3. Cristobol, Canal Zone.**—*I.L.D.*

9.3–262 551.582.2(728.9)

*British Caribbean Meteorological Service, **Climatological summaries, 1955.** Issued 1956? unpaged. Mostly tables. Mimeo. **DWB** (M82.2/728.9 B862c)—Tables are presented (1 page for each station) giving standard monthly and annual climatic data for 1955 for 49 stations, and a consolidated table giving monthly and annual precipitation, and maximum 24 hour precipitation for 35 selected stations in the Bahamas, Jamaica, Brit. Honduras, St. Kitts, Barbados, Trinidad, Brit. Guiana, etc. Coordinates and other details of each station are also tabulated. For several stations 07h, 13h and 19h data are included. *Subject Headings:* **1. Annual climatic data summaries 2. British West Indies 3. British Guiana.**—*M.R.*

9.3–263 551.582.3

Steinhauser, Ferdinand (*Zentralanstalt f. Met. und Geodynamik Vienna*), **Grundsätzliche und kritische Bemerkungen zur Ausarbeitung von Klimakarten.** [Basic and critical remarks on the preparation of climatic maps]. *Geographischer Jahresbericht aus Österreich*, Vienna,

26:1–24, 1955/1956. fig., 2 tables, 25 refs. **DWB**—The plan of the WMO for a world climatic atlas is discussed. It involves the construction of national atlases which are then to serve as the material for regional atlases and for a world atlas. The climatic maps are divided into three priority classes and the climatic maps are to be divided into physical and dynamic. An equal area projection is to be used for the world atlas and the data should be for the period 1921–1930. The construction of national climatic atlases present much more complicated problems which are illustrated by a climatic atlas for Austria. The choice of scale representation, of climatic variables, etc. are discussed in detail. Finally, the author presents some remarks on the recently published climatic atlases. *Subject Heading:* **1. Climatic atlases.** —*I.L.D.*

CLIMATIC CHANGES

See also: **Ice Age** (Ebers), 9.3–6; **Narrative of second Defence Res. Board Exped.** (Manning), 9.3–42.

9.3–264 551.583.14(42)

Brotherton, Bertram, **Weather decline at Worcester.** *Weather*, 8(4):128, April **1953.** table. **DWB**—Monthly figures show a steady fall of mean temperature 1949–1952. *Subject Headings:* **1. Climatic trends 2. Worcester, Eng.**—*C.E.P.B.*

9.3–265 551.583.2:551.311.12

Tollner, Hanns, **Stehen die Ostalpengletscher vor einer Änderung ihres Verhaltens?** [Are the Eastern Alpine Glaciers on the verge of a change in their behavior?] *Wetter und Leben*, Vienna, 8(5/7):123–127, **1956.** fig., 2 tables, 7 refs. **DWB**—The author examines the problem whether the gradual recession of the East Alpine glaciers of the Glockner and Sonnblick groups indicates the beginning of continuing gradual disappearance of the glaciers. The author discusses in general terms the determination of the balance between growth and ablation of a glacier and the oscillations of the mass in the nival region. Data are presented on the movement of the tongues of small glaciers of the Grossglockner-Sonnblick group from Sept. 1954 to Sept. 1955, annual increase in firn (in cm) in the col between Rauriser, Sonnblick and Goldbergspitze from 1948 to 1955 and variations in the meteorological elements over this interval in the same region. From the present data on glacial variations it is impossible to predict with certainty the initiation of a continuous recession. *Subject Headings:* **1. Glacial ablation 2. Glacier variations 3. East Alpine Glaciers.**—*I.L.D.*

9.3–266 551.583.3:581.9(410)

Godwin, H., **Quarternary history and the British flora.** Address to Sec. K (Botany) at the Sheffield Meeting of the British Association on Aug. 30, 1956. *Advancement of Science*, London, 13(50):118–124, Sepz. **1956.** 2 figs. **DLC**—The variations of climate in Britain since the beginning of the Eemian interglacial (radiocarbon dating 45,000 B.P.) with pollen zones, North Sea level and forest cover, and in more detail since 25,000 B.P. with variations of high-arctic, arctic-alpine, weeds, thermophilous and woodland species, are shown in diagrams and discussed. Arctic refuges in mountain regions are postglacial. Weeds were abundant in late glacial, restricted by forests and spread again after agriculture began. *Subject Headings:* **1. Quarternary climates 2. Plant distribution 3. British Isles.**—*C.E.P.B.*

9.3–267 551.583.7

Dorf, Erling (*Dept. of Geology, Princeton Univ.*), **The earth's changing climates.** *Weatherwise*, Boston, 10(2):54–59, April **1957.** 2 figs., 10 refs. **DWB**—A lucid review of the climates of the past 500,000,000 years, and the evidence therefor, plus a more detailed account of climatic changes during the pleistocene. One large two-page chart (revised from C. E. P. Brooks, 1951) shows the various eras and the mean temp. 40°–90°N. since the Precambrian and including recent fluctuations. Four charts of N. America show the respective limits of continental ice and forests in four epochs of the Cenozoic. *Subject Headings:* **1. Climatic changes 2. Geological climates 3. North America.**—*M.R.*

MICROCLIMATOLOGY

See: **Great Plains Turbulence Field Program** (Lettau, Davidson), 9.3–1; **Micromet. data, Golodnaya Steppe** (Laĭkhtman, Aizenshtat, *eds.*), 9.3–15; **Soil climate, Indonesia** (Mohr), 9.3–23; **Comparison of plant develop. in microenvironments** (Bliss), 9.3–37; **Effect of microclimatic temp.** (Lake), 9.3–113; **Cases of damage and met. interpr.** (Höller), 9.3–121; **Formation of ship's hold climate** (Bullig), 9.3–124; **Measurement of temp.** (Brumbach), 9.3–125.

CLIMATIC CLASSIFICATION

See also: **Climatic classification** (Kaĭgorodov), 9.3–8; **Recommendations Socorro Conf.** (White), 9.3–32; **Biological characteristics of potato plant** (Malyshev), 9.3–109; **Develop. and growth processes** (Malyshev), 9.3–110; **Obs. in tropical rain forest** (Goodnight), 9.3–116.

9.3–268 551.585

Nicolas, Jean-Paul, **Essais sur deux nouveaux indices climatiques saisonniers pour la zone intertropicale.** [Proposal of two new seasonal climatic indices for the intertropical zone.] *Institut Français d'Afrique Noire, Dakar, Bulletin, Ser. A*, 18(3):653–664, July **1956.** fig., 2 tables, 6+5 eqs. **DWB**—An index is developed for expressing the effect of a dry or wet season or month upon plants. The index of the winter season is

$$A = \frac{P \times \frac{n}{S}}{280 - \frac{u}{200}} \times \frac{100}{(36.5 - T)(T - T_n)} + \frac{H}{10\,N} + \frac{N}{15}$$

(*n*—cloudiness, *P*—number of days in month, *U*—present relative humidity, *T*—mean temperature in °C, T_m—mean maximum temperature, T_n—mean minimum temperature, *R*—precipitation in mm, *N*—number of days with rain). Also the index for the dry season is given. The application to various meteorological stations in Senegal and Mauritania is illustrated. *Subject Headings:* **1. Climatic indexes 2. French West Africa.**—*I.L.D.*

9.3–269 551.585.53:63

Evenari, Michael and Koller, Dov, **Ancient masters of the desert.** *Scientific American*, 194(4):39–45, April **1956.** 8 photos, 5 maps. **DWB, DLC**—In the Negev, south of the Dead Sea, about 2000 years ago, 6 cities, among them Petra, the Capital of the Nabateans, flourished and maintained an agriculture for over 600 years with a rainfall of <4″ a year. Elaborate terracings and diversion dams made maximum use of water and soil in the wadies, where occasional showers in the hills produce torrents which go unused if uncontrolled. These people pushed agriculture farther into the desert than any other known people. Climatic change, as suggested by E. Huntington as an explanation, is ruled out by lack of shrubs or trees where irrigation was not practiced. *Subject Headings:* **1. Desert agriculture 2. Wadi terracing 3. Negev, Israel.**—*M.R.*

9.3–270 551.585.7 551.582.2(439.1)

*Láng, Sándor, **Természeti földrajzi tanulmányok az Északmagyarországi középhegységben.** [Physical geography of the North Hungarian mountains.] *Földrajzi Közlemények*, Budapest, 77(1/2):21–64, **1953.** fig., tables, 27 refs. Russian and German summaries p. 62–64. **DLC** (G9.M18)—The region described is the northern rim of Hungary from the Danube to the Bodrog rivers, a region with a diversified relief including mountains with elevations up to 3300 ft. The climatic elements discussed are pressure (table of monthly averages for 4 stations, discussion of daily and annual variations), wind conditions, radiation climate (table of monthly number of hours of sunshine at 4 stations), temperature (mean temp., cumulative temp. of the growing period, annual variations, number of summer days, dates of first and last day with freezing temp., table of monthly mean temp. at 17 stations), humidity, evaporation, precipitation (table of monthly mean precipitation for 23 stations, discussion of

seasonal distribution and distribution with height) and local climatic peculiarities. The data presented are for the period 1901–1930; those for precipitation include values for 1901–1940, 1923–1952 and 1942–1951. *Subject Headings:* **1. Mountain climatology 2. Long period records 3. Climatic data 4. North Hungary.**—*G.T.*

BIOCLIMATOLOGY

See also: **Problems of vision in flight** (Whiteside), 9.3–98; **Considerations on quantitative climat. study** (Buckens), 9.3–120; **Resort climates, U.S.S.R.** (Chubukov), 9.3–127; **Universal bioclimatic scale** (Brazol), 9.3–132

9.3–271 551.586:612.014.4(213)

Woolrich, W. R. **Recent studies of livability factors in heating and cooling the individual in tropical climates.** (In: Mid-Southwest Conference on Tropical Housing and Building, Austin, Texas, April 1952, **Proceedings.** Austin, 1952? p. 105–115.) **DWB** (M690 M629p)—The author reviews the various fallacies that attribute debilitating effects to warm climates and discusses the design and construction of houses so as to render them climatologically comfortable. *Subject Headings:* **1. Comfort climate 2. Tropical climates 3. Tropical housing.** —*I.L.D.*

9.3–272 551.586:59:551.45

Bodenheimer, F. S. (*Dept. of Zoology, Hebrew Univ.*), **Problems of animal ecology and physiology in deserts.** (In: **International Symposium on Desert Research, Jerusalem, May 7–14, 1952, Proceedings,** p. 205–229, pub. **1953.** 10 figs., tables, 25 refs. Discussion, p. 227–229.) **DWB**—In this comprehensive ecological study, desert life is defined as "life in an extremely arid environment without precipitation for at least an uninterrupted period of six months and usually with very reduced amounts of precipitation (yearly average below 100 mm) falling within a very short season." The paper includes a discussion of the adaptation of reproductive cycles of animals to desert conditions (of mammals and insects), the hypertrophy of the *Cullae tympanicae* in desert mammals, the energy of birds in deserts and water balance in desert mammals. *Subject Headings:* **1. Desert animal ecology 2. Desert research 3. Acclimatization.**—*I.L.D.*

9.3–273 551.586:612

*Buskirk, E. R.; Tampietro, P. F.; Welch, B. E. and Marcinek, J. G., **Caloric intake and energy expenditure of eight men in a temperate environment.** *U. S. Quartermaster Research and Development Center. Environmental Protection Research Div., Technical Report,* EP-52, March **1957.** 11 p. 6 tables, 10 refs. **DWB** (M86 U585t)—Caloric intake and expenditure were studied in eight men during a twelve day period in a temperate environment at Natick, Mass. Outdoor activity consisted of marching 10 to 11 mi per day. The mean ambient temperature during daylight hours was 22.2°C (72°F), the mean relative humidity was 68%, and the mean windspeed was 2.8 m, per hour. I. Caloric intake averaged 2812 Calories/man/day during the entire study. The range in the average caloric intake was from 2259 to 3453 Calories/day. 2. Average body weight changed little during the course of the study. 3. Daily energy expenditure (marching and other activities) during the entire study was 2899 Calories/man/day, and ranged from 2625 to 3163 Calories/day. *Subject Headings:* **1. Physiological climatology 2. Human activity 3. Caloric intake-energy expenditure relationships.**—*Authors' abstract.*

9.3–274 551.586:519.24

Picko, Václav and Bartoníček, Miloš (*Ústav hygieny, Prague*), **Aplikace jedné z novějších metod mathematické statistiky v bioklimatologii.** [Application of a new method of mathematical statistics in bioclimatology.] *Meteorologické Zprávy,* Prague, 10(2):48–52, **1957.** 4 tables, 5 refs., eqs. Russian summary p. 48. **DWB**—A method of three-class analysis of variance is described, whereby the effect of various parameters and their combinations on total deviation of observed temperature from long-period normals may be determined. *Subject Headings:* **1. Statistical methods in bioclimatology 2. Temperature anomalies.**—*Trans. of authors' abstract.*

UPPER AIR CLIMATOLOGY

See: **Upper air climatology, U. S.** (Ratner), 9.3–11.

ENVIRONMENTAL INFLUENCES

See: **Natural forest pattern of Europe** (Rubner), 9.3–114; **Effect on stream flow** (Love), 9.3–118; **Laws of absorption of storm rain runoff** (Armand), 9.3–246.

MISCELLANEOUS

SOLAR INFLUENCES

9.3–275 551.590.24:551.510.535

Lejay, R. P. and Durand, J. (*both, Nat. Lab. of Radioelectricity, Bagneux/Seine*), **Comparaison des résultats des sondages ionosphériques à Bangui, Ibadan, Khartoum, and Leopoldville.** [Comparison of results of ionospheric sondes at Bangui, Ibadan, Khartoum, and Leopoldville.] (In: **Solar eclipses and the ionosphere: a symposium** . . . ed. by W. J. G. Beynon and G. M. Brown. London, Pergamon, **1956.** p. 85–93. 10 figs., 6 refs.) **DWB**—Results for the *F*2 region are compared for the eclipse of 25 February 1952. At Bangui and Ibadan, those stations nearest to the magnetic equator, there is clear evidence for the appearance during the latter half of the eclipse of a new *F*2 stratification below the "old *F*2" layer. Although less marked, an analogous phenomenon is detected at Khartoum, but at Leopoldville (magnetic dip 33.5°S) it is absent. Rapid increase in height of the "old *F*2" layer, without change of its critical frequency, also seems to accompany the appearance of the "new *F*2" layer. Possible causes of this effect of proximity to the magnetic equator are considered. *Subject Headings:* **1. Solar eclipse, Feb. 1952 2. F2 stratification 3. Magnetic equator 4. Central Africa.**—*Authors' abstract.*

9.3–276 551.590.24:551.510.535:550.38

Nagata, Takesi; Rikitake, Tsuneji and Nakata, Yoshiaki (*all, Geophysical Inst., Tokyo Univ.*), **The effect of solar eclipse on the lower part of the ionosphere and on the geomagnetic field.** (In: **Solar eclipses and the ionosphere: a symposium** . . . ed. by W. J. G. Beynon and G. M. Brown. London, Pergamon, **1956.** 7 figs., table.) **DWB**—The changes in the electron density of the *E* layer for the solar eclipse of May 9, 1948 have been investigated on the basis of many observations in Japan and China. The distribution of the change can be shown on a chart in which local time is conventionally taken in place of longitude, and it is evident that the electron density decreased over a large area, the boundary of which reached far beyond the areas of the optical eclipse. The changes in the electrical conductivity, integrated throughout the layer, have been obtained, using the electron-density distribution determined and making suitable assumptions. The modification of the S_q current-system by the presence of the non-uniformly conducting area due to the eclipse was thus determined, and the three elements of the magnetic field caused by the "additional current-system" (opposite to the original current at the centre of the eclipsed area) were obtained. The geomagnetic effect of the eclipse can be obtained for different observation points by moving the distribution of the magnetic field on the earth's surface along the path of the eclipse, making due allowance for the change in the direction of the original *S* current during the eclipse. With this convention, the changes in the magnetic elements at a given station were obtained and were found to agree well with the observed changes. *Subject Headings:* **1. Eclipse effects on ionosphere 2. Eclipse effects on geomagnetism 3. Solar eclipse, May 1948 4. Japan 5. China.**—*Authors' abstract.*

9.3–277 551.590.24

Nicholson, Thomas D. (*Amer. Museum-Hayden Planetarium*), **Solar eclipse activities in Ceylon, 1955.** *Scientific Monthly*, Wash., D. C., 82(5):221–228, May **1956.** 9 figs. (incl. photos). **DWB, DLC**—The solar eclipse of 20 June 1955 which lasted 7 minutes 7.8 seconds

at a point in the South China Sea was reported to be the longest eclipse in nearly 1250 years. The meteorological and topographic factors favoring Ceylon as an observation site are noted. The participating groups and personnel, the equipment used and its installation and the types of observation planned are described with the aid of photographs. The value of the data obtained in spite of the weather conditions that developed on the day of eclipse and which caused the eclipse as a whole to be a failure is briefly noted. *Subject Headings:* **1. Solar eclipse, June 1955 2. Eclipse observations 3. Ceylon.**—*I.L.D.*

9.3–278 551.590.25:551.510.535:551.594.12

Minnis, C. M. (*Radio Research Station, Slough*), **The F2 layer during eclipses of 1952, 1954, and 1955.** (In: **Solar eclipses and the ionosphere: a symposium** . . . ed. by W. J. G. Beynon and G. M. Brown. London, Pergamon, **1956.** p. 81–84. 2 figs., table, 8 refs.) **DWB**—It is desirable that the electron density as a function of height in the F2 layer should, where possible, be computed, because the changes in f_0F2 alone during an eclipse can give a misleading impression of the response of the layer to the drop in incident radiation intensity. At Khartoum in 1952, f_0F2 remained almost constant for two hours during the eclipse, although there were marked changes in electron density at constant height at all levels. Assuming that these changes can be accounted for by an attachment process, values of the attachment coefficient have been derived which are similar to those obtained by Savitt at Bocayuvo. The great height of the layer at Khartoum has allowed values to be computed for heights up to 400 km. The small difference between f_0F1 and f_0F2 at Inverness and Slough in 1954 has made it difficult to deduce the shape and true height of the F2 layer. After allowing for the retardation due to the F1 layer, it is concluded that the observed fall in f_0F2 was not accompanied by any appreciable change in the height or thickness of the F2 layer. The attachment coefficient determined for the peak of the F2 layer was considerably smaller than the values obtained at Bocayuvo and Khartoum for the same height. *Subject Headings:* **1. Solar eclipses 2. Electron density in F2 region 3. F2 layer.**—*Author's abstract.*

VISIBILITY

See: **Visibility from satellite at high altitude** (Stakutis), 9.3–86; **Operational flight evaluation** (Sperry), 9.3–97.

OPTICAL PHENOMENA

9.3–279 551.593:551.521.18:551.575

Bricard, Jean and Veret, Claude, **Recherches sur la propagation de la lumière visible et infrarouge à travers la brume et le brouillard.** [Research on the propagation of the visible and infrared light across haze and fog.] *Académie des Sciences, Paris, Comptes Rendus,* 238(4):503–505, Jan. 25, **1954.** fig., 6 refs. **DLC**—The optical density of an atmosphere containing water droplets was measured for different wave lengths. For haze the optical density was below 2 per km in the visible part (at 0.4μ) and 10 to 100 times less in the infrared (around 10μ). Fog gave a density of the order of 10/km, extending far into the infrared. *Subject Headings:* **1. Optical density of haze 2. Optical density of fog 3. Infrared light 4. Haze 5. Fog.**—*A.A.*

9.3–280 551.593.54

Kendrew, W. E. (*Met. Office*), **Blue suns.** *Tellus,* Stockholm, 8(3):410, Aug. **1956. DLC**—At noon on Sept. 27, 1951 while at Resolute, NWT (74.5°N, 59°W) the author observed a dark blue sun shining through thin altostratus, accompanied by 2 sun dogs. The blue color lasted for half an hour after first noticed. This date corresponds with the dates when blue sun was observed in Denmark, France, Spain and Sweden. No other such occurrences have been noted by the author in any other log books of the Arctic weather stations. *Subject Headings:* **1. Blue sun—Sept. 1951 2. Resolute, Northwest Territories.**—*M.R.*

9.3–281 551.593.7:551.93.55

Divari, N. B., **O poliarizatsii sveta sumerechnogo neba v zenite.** [Polarization of light in the zenith of a twilight sky.] *Akademiia Nauk SSSR, Doklady,* 112(2):217–220, Jan. 11,

1957. 3 figs., table, 9 refs. **DLC**—The results of a study of the intensity and degree of polarization of the night sky carried out during Sept.–Oct. 1955 at the Mountain Astophysical observatory of the Academy of Sciences of the Kazakh SSR. Observations were carried out in four spatial regions selected by filters and effective wavelengths of 470, 520, 570 and 600 mph. The discussion includes the mean value of degree of polarization in the zenith as a function of solar declination, the evaluation of angle φ formed by the plane of polarization and by the plane of the solar vertical, comparision of the variation of the intensity of twilight light in the zenith in various wave lengths, the morning and evening values of the light polarization of the twilight only, etc. *Subject Headings:* **1. Twilight polarization 2. Polarization 3. Kazakh, SSR.**—*I.L.D.*

ELECTRICAL PHENOMENA

See also: **Parliament to get report on increase radioactivity** (News of Norway), 9.3–134; **Alpha-radioactivity distrib. in forest types** (Curtis), 9.3–137; **F2 layer during eclipses** (Minnis), 9.3–278; special bibliog. on **Radioactivity in atmos.,** p. 324.

9.3–282 551.594.12:551.510.535:551.524.7

Mariani, F., **Temperatura e densità elettronica nella regione F della ionosfera.** [Temperature and electron density in the F region of the ionosphere.] *Annali di Geofisica*, Rome, 9(2):245–271, April **1956.** 10 figs., 18 refs., 39 eqs. English summary p. 268. **DLC**—A thorough experimental and theoretical treatment of the temperature and electron density anomalies of the F2 layer. These anomalies cannot be explained on the basis of diurnal or seasonal variations in temperature at heights equivalent to those of the F2 layer. The author assumes that the F1 and F2 layers originate in the same manner by an ionization process in which the F2 layer is formed by a diminution of the recombination coefficient with height and the boundary between F1 and F2 layers by a discontinuity in temperature gradient. Several models are developed for ionization regime at lat. 45° for summer and a winter solstice day. From these curves some of the anomalies may be explained. *Subject Headings:* **1. Ionospheric temperatures 2. Ionospheric electron density 3. Electron density in F layers.**—*M.R.*

9.3–283 551.594.13:551.510.535

*Baker, Doran J. (*comp.*), **Electron densities of the ionosphere utilizing high-altitude rockets.** Utah. Univ. Upper Air Research Laboratories, Contract AF 19(604)-384, Scientific Report No. 2, Dec. **1956.** 87 p. 30 figs. (incl. photos), 6 tables, foot-refs., 94 eqs. "Doctoral thesis, Utah Univ."—Aerobee rocket data are used to test the author's theory regarding electron densities in the ionosphere (E layer). The equations for ionospheric propagation are derived under the assumption that free electrons are inductive and do not allow the negative capacitance usually postulated. Equipment is illustrated photographically, records and curves presented and data appended. *Subject Headings:* **1. Ionospheric electron density 2. Ionospheric propagation theory 3. Rocket ionospheric data. I. Utah. Univ. Upper Air Research Laboratories.**—*M.R.*

9.3–284 551.594.12:551.510.535

Bates, D. R. (*Dept. of Applied Math., Queen's Univ., Belfast*), **Formation of the ionized layers.** (In: **Solar eclipses and the ionosphere: a symposium** . . . ed. by W. J. G. Beynon and G. M. Brown. London, Pergamon, **1956.** p. 184–188. table, 23 refs., 3 eqs.) **DWB**—A short summary is given of current views regarding the processes responsible for the formation of the ionized layers. It seems probable that D is due to the photo-ionization of nitric oxide by the Ly-α line; that E is due mainly to the action of X-rays in the wavelength region centered about 40Å; and that both F1 and F2 may be due partly to the action of longer X-rays and partly to the photoionization of atomic oxygen by ultraviolet radiation. *Subject Headings:* **1. Ionized layer formation 2. Ionospheric ionization.**—*Author's abstract.*

9.3–285 551.594.22:69(494) 551.58:628.8

*Bider, Max (*Basel Univ.*), **Klimatische Daten Basels für das praktische Leben.** [Climatic data of Basel for practical use.] *Basel. Universität. Astronomisch-Meteorologische Anstalt, Mitteilungen, Meteorologische Reihe*, No. 3, **1956.** 54 p. figs., 32 tables. Reprinted from

Pt. 1, 1956 of *Wirtschaft und Verwaltung*, pub. by Statistical Div. of Basel Canton. Also his: **Gewitter und Blitzschäden in Basel.** [Thunder and lightning damage in Basel.] *Leben und Umwelt*, Basel, 12:273–274, Sept. **1956.** table. **DWB**—In the first article the quantitative characteristics of the various meteorological variables are described with special reference to various human activities such as housing construction, heating, etc. In the case of insolation, data are given for the monthly values of solar elevation and solar azimuth, hourly values of sunshine duration, solar intensity in cal/cm² upon vertical surfaces according to direction and time of day and daily totals of solar intensity upon a vertical surface. Tables giving monthly frequencies of mean daily temperature for year for 1929–1955 and 1891–1930, monthly degree days and heating days (1929–1955), number of hours with temperatures below 0°C, frequency of sequence (periods) of a particular number of days such as days with −10°C etc., mean soil and air temperature, temperature of the Rhine, etc. Similarly, detailed data are given on relative humidity, precipitation, snow conditions, winds and storm damage. Also air pollution is discussed, a table giving climatic normals for Basel (St. Margaretha) 1921–1955 is included. In second article, author points out that buildings damaged in Basel (37 km²) increased from 1.1/yr in 1881–1905 to 11.8/yr in 1931–1955. In 1955 there were 43 cases, mostly on Aug. 27 and 20. The increase of damage per case from 101–302 fr is due to the rise of costs. There were 6 deaths in 1881–1955, all men in the open. *Subject Headings:* **1. Climate of Basel 2. Radiation on vertical surfaces 3. Building climatology 4. Degree days 5. Lightning damage 6. Basel, Switzerland.**—*I.L.D., C.E.P.B.*

9.3–286 551.594.221

Schonland, B. F. J., **Lightning and the long electric spark.** (Paper read at the Royal Institution of Great Britain's weekly evening meeting, Friday 25 Nov. 1955). London, **1956.** 13 p. 3 plates.—Description of information given by fast moving camera and electric field-change recorder about breakdown processes in lightning and in partially evacuated glass tubes. First downward streamer (pilot leader) only carries about 100 amp, is very feebly luminous and moves about 100 km/s in steps. The return stroke of 100,000 amp moves about 100,000 km/s. Other streamers are described. Long electric sparks or sparks in oil involve strictly comparable phenomena. Discharges within clouds are studied by electrical field change and radar, showing streamers moving upwards about 20 km/s between strokes. *Subject Heading:* **1. Lightning discharges.**—*C.E.P.B.*

AURORAS

See: **Study of arrival of auroral radiations** (Van Allen), 9.3–87.

SFERICS AND RADIO METEOROLOGY

See: **Ionospheric reflection type waveforms** (Nakai), 9.3–169; **Reflections between earth and ionosphere** (Wait), 9.3–170.

PART II. ANNOTATED BIBLIOGRAPHY ON RADIOACTIVITY IN THE ATMOSPHERE

(SUPPLEMENT)

By *Geza Thuronyi*

INTRODUCTION

This bibliography is a supplement to one published earlier in *Meteorological Abstracts and Bibliography*, 7(5):616–657, May 1956. The primary subject of this supplement, as of the original bibliography, is the radioactivity of fission products in the atmosphere, its distribution in space and time, its measurement, computation and prediction. Again, as in the earlier bibliography, this principal subject has been supplemented by reference to literature in peripheral fields like non-radioactive effects of nuclear weapons, natural radioactivity of the atmosphere, etc.

No attempt was made either in the original bibliography or in this supplement to cover the available literature on natural radioactivity in the atmosphere systematically. The reader interested in this field is referred to the recent textbook of H. Israël (9C–62) which contains a thorough review of the subject with extensive bibliographic references.

The period covered (with very few exceptions) is that of 1955–1958, a period of intense research activity (as well as public debate) in connection with problems raised by a world-wide contamination of the atmosphere and the earth's surface with radioactive fission products. Two reports of major scope (each in two sizable volumes), one published in the United States of America and one in Japan, give a fairly clear idea of the range of activities in those two countries (see **Congressional hearings,** 9C–166 and **Japanese committee report,** 9C–66). Accounts of symposia held in France (9C–19) and Germany (9C–2, –152, –186) indicate the active interest more and more countries are now taking in routine observation of atmospheric radioactivity. Another indication of interest in radioactive fallout is the fact that several bibliographies have been prepared on the subject during the last two years (9C–25, –166). Numerically the literature on fission-product radioactivity has shown a definite increase during the period covered; subjectwise the interest, on the whole, has shifted from more general discussions of fallout to the specific problems of global distribution of radiostrontium (Sr^{90}) and its uptake by various materials and by the human body.

For a better perspective of various details and aspects of subject matter contained in the literature cited, and of the distribution of activities over the globe, a Subject and a Geographic Outline are given below.

We wish to express our appreciation to Mr. Robert J. List of the U. S. Weather Bureau, Washington, D. C., for many valuable suggestions and contributions.

Note: In item 7E–78 in the May 1956 bibliography some dates have been confused and should be corrected as follows: on p. 631, line 4, *change* "June 6–15" *to read* "the same day"; line 5, *change* "June 18–19" *to read* "Oct. 18–20, 1951." In succeeding lines *delete* "June" and *insert* "Oct. 1951."

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9C–1 551.510.721

Anderson, E. C.; Schuch, R. L.; Fisher, W. R. and Van Dilla, M. A., **Barium-140 radioactivity in foods.** *Science,* Wash., D. C., 127 (3293):283–284, Feb. 7, **1958.** fig., table, 4 refs. **DLC**—The presence of the fission products barium-140 and lanthanum-140 in various locations in the U. S. during the summer of 1957 is reported. Peak levels measured are tabulated and found to be insignificant from the point of view of radiation hazard. No barium-140 could be detected in human subjects. Measurement of these fission products may be of value in the study of the fallout process. *Subject Heading:* **1. Radioactive fallout composition.**—*G.T.*

9C–2 551.508.9:551.510.7 (08)

Arbeitstagung über die Geräteentwicklung zur Überwachung der Radioaktivität in Luft und Wasser, veranstaltet von der Frieseke & Hoepfner GmbH, Erlangen-Bruck, am 9. und 10. Juli 1957. [Symposium on instrument development for surveying radioactivity in air and water, held by Frieseke & Hoepfner Ltd., Erlangen-Bruck, on July 9 and 10, 1957.] *Atompraxis,* Karlsruhe, 3 (10):353–409, Oct. **1957.** figs., tables, refs., eqs. **DLC**—The purpose of this symposium was to discuss physical and engineering problems of radioactivity (due to fallout, nuclear reactors and the use of radioactive isotopes) in the atmosphere and in water. Biological aspects of radiation were consciously avoided. The emphasis is on instruments developed for sampling and measurement of radioactive substances. Instruments are described in detail and shown in photographs and diagrams; their performance characteristics are specified. The papers presented at the symposium are given in their entirety, in the following arrangement:

Fassbender, H. (*Chairman of the meeting*), **Einleitung,** [Introduction], p. 354.

Bosch, J., **Allgemeine Übersicht über die Methoden der Strahlungsüberwachung,** [General review of radiation survey methods], p. 355–358. Natural and artificial sources of radiation, maximum

permissible radiation levels, and methods of measurement are reviewed. Maximum permissible concentrations of over a dozen radioactive substances in air and water, and sensitivities of some two dozen instruments for radiation measurement in air and water are shown graphically.

Waechter, G., **Strahlungsüberwachung mit Zählrohren,** [Radiation survey with counter tubes], p. 358–361. Smallest amounts of α, β or γ radiation that can be detected with counter tubes are determined.

Naumann, H.-H., **Dosimetrie mit Ionisationskammern,** [Dosimetry with ionization chambers], p. 362–368.

Böhm, H., **Derzeitige technische Möglichkeiten zur Strahlungsüberwachung in Gasen mit Ionisationskammern,** [Present technical possibilities of radiation survey in gases with ionization chambers], p. 369–372. The Friesecke & Hoepfner, Type FH 53 radiation survey unit described and illustrated in this paper consists of a closed ionization chamber, an electrometer and other electronic parts. It has been designed for use in areas of potential radiation hazard and is equipped with an automatic warning device. A more flexible universal electrometer, Type FH 56 is also described.

Neuwirth, R., **Diskontiuierliche Bestimmung des radioaktiven Aerosolgehaltes in Luft,** [Discontinuous determination of radioactive aerosol content in air], p. 372–377. Sampling of radioactive dust (especially by means of a portable electrostatic precipitator) and its measurement (methane-flow counter described and illustrated) are discussed.

Zumach, W., **Abscheidung radioaktiver Aerosole mit Faserfiltern,** [Sampling of radioactive aerosols with fiber filters], p. 377–382. General review, and results of the author's own investigation of filter efficiency.

Buchner, W., **Kontinuierliche Messung des radioaktiven Aerosolgehaltes der Luft,** [Continuous measurement of radioactive aerosol content in air], p. 382–387. Description of dual-channel, fiber filter dust monitor.

Pfau, A., **Allgemeine Betrachtungen zur Messung und Überwachung der Radioaktivität im Wasser,** [General considerations on measurement and survey of radioactivity in water], p. 389–398. The occurrence of radioactivity (from all known sources of origin) in water during all phases of the hydrologic cycle is reviewed and shown in a diagram. The principal fission products, their percentage of total radioactivity and their maximum permissible concentrations are tabulated. Methods of sampling and measurement, and performance characteristics of the various instruments used in water radioactivity measurement are reviewed and shown in a table.

Jordan, K., **Direktmessung radioaktiver Substanzen in Flüssigkeiten,** [Direct measurement of radioactive substances in liquids], p. 398–402.

Neuwirth, R., **Diskontinuierliche Messung radioaktiver Substanzen in Wasser,** [Discontinuous measurement of radioactive substances in water], p. 402–404. The method described involves vaporization of water samples, and measurement of the residual matter.

Buchner, W., **Kontiuierliche Messung radioaktiver Substanzen in Wasser,** [Continuous measurement of radioactive substances in water], p. 405–407. An apparatus is described which performs vaporization of water samples and measurement of radioactivity continuously.

Some of the discussions are reported on p. 387–388 and 407–409. *Subject Headings:* **1. Radioactivity measurement techniques 2. Radioactivity symposia 3. Instrument symposia.**—*G.T.*

9C–3 551.510.7

Arizumi, N., **On the distribution of ash-fall.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:87–89. 5 figs., 2 refs.) **DLC** (UF767.J32)—Graphs representing the distribution pattern of dust from the volcanic eruption of Mt. Asama in 1950 are presented and discussed. In this eruption ashes were blown up to 6 km height and then diffused in an angle of 20–30 degrees. By way of analogy, the author estimates the distribution of atomic debris having radii from 0.001 to 0.5 mm, with particular application to the nuclear test on Bikini in March 1954 and the position of the fishing boat "Fukuryu Maru." *Subject Headings:* **1. Radioactive fallout patterns 2. Bikini H-bomb tests, 1954 3. Volcanic dust.**—*G.T.*

9C–4 551.510.7:551.556

Bagge, Erich (*Hamburg*), **Luftradioaktivität und Windrichtung.** [Atmospheric radioactivity and wind direction.] *Atomkernenergie,* Munich, 1(11/12):393–395, Nov./Dec. **1956.** 6 figs., 5 refs. **DLC**—Atmospheric radioactivity has been measured in Hamburg, Germany since March 1956 by means of an air filter method. A close relationship was found between the amount of radioactivity captured and wind direction at the sampling site. Larger activities are observed with easterly wind (from the land), smaller ones with southwesterly wind (from the sea) which is in agreement eith the known fact that radioactive emanations are smaller (by a factor of 10^{-2}) over the ocean than over the continent. The study shows that unusual fluctuations in background radioactivity (for example an increase by a factor of 30 from one day to the next) must not necessarily

indicate fallout of fission products but may be caused by shifts of wind direction. *Subject Headings:* **1. Radioactive emanation distribution 2. Wind effects on radioactivity 3. Radioactivity measurement techniques 4. Hamburg, Germany.**—*G.T.*

9C–5 551.508.9:551.510.7

Barreira, F. and Laranjeira, M., **Determinação da radioactividade atmosferica, Pt. 1, Amostragem sobre papel de filtro com determinação de actividade β.** [Determination of atmospheric radioactivity, Pt. 1, Filter paper sampling for β activity determination.] *Lisbon. Universidade. Faculdade de Ciências, Revista, Ser.* 2, *B*, 4:23–46, **1955.** 9 figs., 2 tables, 19 refs. **DWB**—A sampling technique of air activity by means of Waterman 41 filter paper is described. The equation relating the β activity fixed on the filter paper with the sampling time is established. The Rn content in the atmosphere is deduced from the same equation. *Subject Headings:* **1. Radioactivity measurement techniques 2. Radioactivity in the atmosphere 3. Radon content of atmosphere.**—*Authors' abstract.*

9C–6 551.510.7:016

†Blifford, Irving H. (*U. S. Naval Res. Lab.*), **Radioactivity of the atmosphere.** *U. S. Naval Research Lab., NRL Report* 4118, April 15, **1953.** 41 p. 11 figs., 6 tables. Appendix: Blifford, I. H. and Lockhart, L. B., Jr., **Bibliography of scientific work on atmospheric radioactivity.** 416. refs. **DWB**—A survey is made of the subject of the radioactivity of the atmosphere, from its discovery to the present time. A historical review of investigations of atmospheric radioactivity is given including discussions of its occurrence, experimental methods of observation, and original measurements by the author. *Subject Headings:* **1. Radioactivity in the atmosphere 2. Radioactivity bibliographies.**—*Author's abstract.*

9C–7 551.508.9:551.510.7

Blifford, I. H., Jr.; Lockhart, L. B., Jr. and Baus, R. A., **Collection of atomic bomb debris from the atmosphere by impaction on screens.** *Science*, 123(3208):1120–1121, June 22, **1956.** fig., table, refs. **DLC**—Collection efficiency (for radioactive particles) of a steel screen (or ordinary cheesecloth) mounted on a rotating vane is discussed. Comparison with a filter technique and the standard gummed-paper technique shows that the screen device has satisfactory efficiency especially in the absence of rain. *Subject Heading:* **1. Radioactivity measurement techniques.**—*G.T.*

9C–8 551.510.72:662.2:539.1

Blifford, I. H., Jr.; Friedman, H.; Lockhart, L. B., Jr. and Baus, R. A., **Geographical and time distribution of radioactivity in the air.** *Journal of Atmospheric and Terrestrial Physics*, London, 9(1):1–17, July **1956.** 9 figs., table, 6 refs. **DWB**—Continuous measurements of radioactivity have been made for various periods during 1950–1954 at 15 widely distributed places. The geographical distribution of natural radon and thoron and variations of radon in 1950 are discussed. Fission products can be distinguished from natural radioactivity by rate of decay. In curves of fission product beta activity at Washington in 1950–55 all except British test explosions were identified, and activity was observed on over 70% of days. The highest recorded was 6×10^{-16} curie/cc at San Diego following Nevada tests of Feb. 1951. Atomic explosion products are rapidly dissipated but thermonuclear explosions form a persistent reservoir of radioactivity in the stratosphere. (*Same item as* 7.11–299, Nov. 1956, *MAB.*) *Subject Headings:* **1. Radioactivity in the atmosphere 2. Atomic explosion effects.**—*C.E.P.B.*

9C–9 551.510.721

*Blifford, Irving H., Jr. and Lockhart, Luther B., Jr., **Radioactivity of air and fallout samples collected on the 80th meridian.** *U. S. Naval Research Laboratory, NRL Memorandum Report*, 626, Aug. **1956.** 3 p. 8 tables. Also published in *Congressional Subcommittee Report* (9C–166), p. 652–656. **DWB**—This brief report contains data for atmospheric radioactivity collection sites along the 80th meridian for May and June 1956 (Guayaquil, Panama, Lima and Wash., D. C.). A table shows dates when collections were started at these stations and at Santiago, Chile, and names of stations not yet in operation. Cloth screens for wind vanes, gummed paper and small filters are supplied to stations, samples are shipped to Washington and are counted on 14th day after collection. Tables give β data for 3 different methods of collection. (*Same item as* 8.8–96, Aug. 1957, *MAB. For later reports see* 9C–96, 97.) *Subject Headings:* **1. Radioactive fallout networks 2. Radioactive fallout data.**—*M.R.*

9C–10 551.578.7:551.510.7

Blifford, Irving H., Jr.; Patterson, R. L., Jr.; Lockhart, L. B., Jr. and Baus, R. A. (*all, U. S. Naval Res. Lab., Wash., D. C.*), **On radioactive hailstones.** *American Meteorological Society, Bulletin*, 38(3):139–141, March **1957.** fig., table, ref. **DWB, DLC**—Measurements of the β activity of 11

hailstones collected in the Wash., D. C., area during a storm on May 26, 1953, (*see* 7E–93, May 1956, *MAB*) show an average value of 1.4×10^{-10} curie/ml. Analysis of concentric layers of 4 stones showed that the β activity of the cores was about 3 times as high as was that of the outside layer, indicating that the hailstones were probably formed in a region of relatively high concentration of fission products. (*Same item as* 8.8–97, Aug. 1957, *MAB*.) *Subject Headings:* **1. Radioactivity of hailstones 2. Hailstorm, Washington, D. C. (May 26, 1953) 3. Washington, D. C.**—*M.R.*

9C–11 551.510.721 (05)

***Bulletin of the Atmospheric Radioactivity,** Tokyo, No. 1, April/June 1955–. Latest issue seen, No. 9, April/June **1957.** Quarterly. About 80 p. each. mostly tables. Pub. by the Japan Meteorological Agency, Tokyo (earlier numbers by Central Meteorological Observatory, Tokyo). In Japanese and English. **DWB**—Work of the fallout radioactivity observation service of the Japanese Meteorological Service is outlined and its data (15 stations and 2 ships from April 1, 1955), methods of collecting rainwater and of measuring radioactivity of rainwater and falling dust, and of analyzing data, eliminating background radiation, station location chart, and standards used are described and presented. Tables include: 1) summary of mean radioactivity in rain collected at a fixed time daily and amount of rain collected; 2) radioactivity in first 1 mm of rain once or twice a day; 3) radioactivity in dust collected in a basin; 4) observed radioactivity in large amount of rain collected at a fixed time daily; 5) atmospheric radioactivity in first 1 mm of rain in storm; 6) radioactivity in air-borne dust collected in a dust collector. (*Same item as* 8.8–7, Aug. 1957, *MAB*.) *Subject Headings:* **1. Radioactive fallout data 2. Serial publications 3. Japan. I. Japan. Central Meteorological Observatory, Tokyo II. Japan Meteorological Agency, Tokyo.**—*M.R.*

9C–12 551.510.721

Campbell, Charles I., **Radiostrontium fallout from continuing nuclear tests.** *Science,* Wash., D. C., 124(3227):894, Nov. 2, **1956.** 5 refs., 2 eqs. Reprinted in Congressional Subcommittee Report (9C–166), p. 1338–1338. **DLC**—The problem of stratospheric storage of Sr^{90} from thermonuclear tests must be resolved before the amount of accumulated Sr^{90} and hence the maximum amount of fallout and soil accumulation at any given time or over any period of years can be calculated. The formulas involved are generally agreed on, but a maximum accumulation of 80 mc/mi^2 yr is estimated by the author, compared with $\frac{1}{10}$ that amount as estimated by Libby (1956), owing to the latter figuring results from one test, and the author figuring on accumulated effects of continuous tests at the rate known to exist in the past few years. The only way to keep the concentration in soil down to a safe level would be to cut down tests, or to decrease input into stratosphere or to increase maximum permissible amount in bodies of people. (*Same item as* 8.8–99, Aug. 1957, *MAB*.) *Subject Headings:* **1. Strontium^{90} fallout 2. Strontium^{90} stratospheric storage 3. Maximum permissible Sr^{90} accumulation. I. Libby, W. F.**—*M.R.*

9C–13 551.510.7:613

†Chamberlain, A. C., **Estimation of maximum permissible levels of radiation.** *Harwell, England. Atomic-Energy Research Establishment, HP/R,* No. 551, Aug. **1950.** 49 p. 8 figs., 11 tables, numerous foot-refs., 31 eqs. Photostat. **DWB**—The evidence on which is based the maximum permissible level of 0.3 rep/week of gamma radiation to the critical tissue, corresponding to 0.5 rep/week measured at the surface of the body, is briefly summarised, and the corresponding levels for other radiations are stated. The methods of deducing the permissible levels under various conditions are indicated. The methods of deduction of permissible levels for ingested isotopes and tables for those most commonly met with are given. Finally the hazards from statistically mixed fission products are considered. *Subject Headings:* **1. Biological effects of radioactivity 2. Radioactivity permissible dosage.**—*Author's abstract.*

9C–14 551.574.1:551.510.7:612.2

*Chamberlain, A. C.; Megaw, W. J. and Wiffen, R. D. (*all, Health Phy. Div., Atomic E. Res. Est.*), **Role of condensation nuclei as carriers of radioactive particles.** *Geofisica Pura e Applicata,* Milan, 36:232–242, Jan./April **1957.** 5 figs., 4 tables, 11 refs., eqs. **DLC**—Radon and thoron decay products are easily attached to condensation nuclei. The high diffusion constant of RaA and ThB (almost the same as for positive ions), results in a high percentage of these products being deposited in the upper respiratory tract when they are uncombined (15–30%) whereas if combined with bunsen nuclei the deposition is 1000 times less (.03–.06%). The combined products are apt to be found in the alveoli rather than the nose, trachea or bronchi as are the uncombined products. The products can be used as radioactive tracers for nuclei just as condensation or ionization properties of nuclei can be used to tag them in chambers or electrical apparatus, respectively. Experiments are described in detail. (*Same item as* 8.11–114, Nov. 1957, *MAB*.) *Subject Headings:* **1. Radioactive nuclei tracers 2. Thoron deposition in respiratory tract 3. Respiratory system retention of radioactive nuclei.**—*M.R.*

9C–15 551.510.72

Chastel, Raymond, **Les effets radio-actifs immédiats et différés des explosions atomiques.** [Immediate and differed radioactive effects of atomic explosions.] *La Semaine des Hopitaux*, Vol. 32, *Pathologie et Biologie*, No. 7: P. et B., 440–445 (i.e., *Annales de la Recherche Médicale*, No. 3: R.M. 136–141.) April **1956.** fig. (Also in: **L'Énergie atomique dans ses répercussions sur la vie et la santé** [Atomic energy in its repercussions on life and health], ed. by P. Biquard. pub. Paris, L'Expansion, **1956.** p. 14–30.) **DNLM**—The different types of electromagnetic and corpuscular radiation emitted during atomic explosions (both fission and thermonuclear) are described. The behavior of radioactive material is analyzed and it is found that large areas may be contaminated and rendered hazardous for a long time by such material. The radiation doses produced are estimated on the basis of several hypotheses and the figures obtained are compared with those obtained in experimental measurements. *Subject Headings:* **1. Thermonuclear explosion effects 2. Radioactive fallout.**—*Trans. of author's abstract.*

9C–16 551.510.72

Chatterjee, Santimay; Patro, A. P.; Basu, B.; Bhattacharyya, R. L. and Banerjee, M. K., **Dating an nuclear explosion.** *Science and Culture*, 20(8):403–404, Feb. **1955.** 5 refs., 4 eqs. **DLC**—A method is proposed for dating nuclear explosions from the composite beta-decay curves of the radioactive dusts. *Subject Heading:* **1. Atomic explosion dating.**—*U. S. AEC abstract.*

9C–17 551.510.721

Cohn, S. H.; Lane, W. B.; Sherwin, J. C.; Gong, J. K. and Weisbecker, L. (*all, U. S. Naval Radiological Defense Lab., San Francisco*), **The preparation and biological application of airborne simulants of fallout from nuclear detonation.** *Air Pollution Control Association, Pittsburgh, Journal*, 7(1):20–25, May **1957.** 8 figs., 5 foot-refs. **DWB, DLC**—Laboratory equipment and procedures are described and illustrated, involving preparation and application of simulated radioactive fallout for tests on animals. The equipment essentially consists of an aerosol generator, the animal exposure chambers, sample collectors for measuring particle size, and supporting equipment. Results of experiments performed on mice are reported. *Subject Heading:* **1. Radioactive fallout simulation.**—*G.T.*

9C–18 551.577.7:551.510.7

Collins, William R., Jr. and Hallden, Naomi A., **Study of fallout in rainfall collections from March through July 1956.** *U. S. Atomic Energy Commission, (Report) NYO-4889*, April 30, **1957.** 26 p. 5 figs., 6 tables, refs. **DLC**—Rainfall radioactivity (total β activity, Sr^{90} activity and Sr^{89}/Sr^{90} ratio) measured throughout the U. S. (March–July 1956) are tabulated. Regression diagrams for Sr^{90} in rainwater and amount of rainfall, and comparative tables for rainwater and total atmospheric fallout activity are presented. The Sr^{89}/Sr^{90} ratio is found to be a better indicator of the age of fallout than the proportion of Sr^{90} to total β activity. Higher Sr^{90} deposition rates in northern latitudes (although tests take place in southern latitudes) suggest the possibility of the existence of a selective entrance zone for atmospheric fallout. *Subject Headings:* **1. Radioactivity in rainwater 2. Strontium ^{90} in rainwater 3. Radioactive fallout propagation 4. United States. I. U. S. Atomic Energy Commission. Health and Safety Lab.**—*G.T.*

9C–19 662.2:539.1:551.510.7(08)

Conférence Scientifique sur les Dangers Atomiques, Paris, July 1–2, 1955, Mémoires et articles. [Papers presented at the Scientific Conference on Atomic Hazards, Paris, July 1–2, 1955.] *La Semaine des Hopitaux*, Paris, Vol. 32, *Pathologie et Biologie*, No. 7, (also called *Annales de la Recherche Médicale*, No. 3), April **1956.** Also issued as **L'Énergie atomique dans ses répercussions sur la vie et la santé.** [Atomic energy in its repercussions on life and health.] Ed. by P. Biquard. Paris, L'Expansion, **1956.** 244 p. figs., tables, refs. **DNLM**—The papers contained in these **Proceedings** deal with problems of the propagation of atomic debris, measurements of radioactivity in rain and contaminated objects, medical problems, possible protection, etc. Much of the material is relevant from the point of view of meteorology. The papers of direct meteorological interest are being abstracted separately. In addition to the formal papers, the **Proceedings** contain accounts of discussions including one on the meteorological effects of atomic explosions (pages P. et B. 462–466 [i.e., R.M. 158–162] or Énerg. Atomique . . . , p. 75–86), in which R. Chastel finds that the energy released in a thermonuclear explosion is comparable to that of typhoons, the fall of large meteorites or volcanic eruptions; T. Yuasa discusses the reduction of solar radiation by dust of atomic or volcanic origin; and J. Orcel attributes the condensation of water vapor on atomic dust to the radioactivity rather than the crystalline form of the dust particles. (For a partial listing of the contents of these Proceedings *see* 8(6):852, June **1957,** *MAB.*) *Subject Headings:* **1. Radioactivity in the atmosphere 2. Radioactivity symposia.**—*G.T.*

9C–20 551.510.7

Cotton, E. S., **Diurnal variations in atmospheric radioactivity.** *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers*, No. 42:67–77, Nov. **1955.** 10 figs., 11 refs., 2 eqs. **DLC**—Continuous measurements of the ionization produced inside two chambers operated at Bedford, Mass., during the autumn months of 1952 and 1953 are discussed, and comparisons are made with meteorological data at ground level. One of these chambers was constructed by the late G. R. Wait and has a cellophane wall of 1.6 mg/cm² absorption thickness. The second chamber uses a screen-wall and an outside clearing field to eliminate residual ions. The chambers and their modes of operation are described. Significant cases of meteorological influence are shown, and the order of magnitude of the diurnal changes is verified using diffusion concepts. *Subject Headings:* **1. Radioactivity variations 2. Radioactivity in the atmosphere.**—*Author's abstract.*

9C–21 551.5:620.92:539.1

Davies, D. A., **Meteorological aspects of atomic energy.** *World Meteorological Organization, WMO Bulletin*, 6(2):50–53, April **1957. DWB**—Notes on international developments (UN, UNESCO, IGY, WHO, FAO and WMO) with respect to meteorological aspects of atomic energy, especially the peaceful uses thereof; the WMO policy-panel of experts, first meeting of the panel in Dec. 1956 at Geneva, suggestions for studies of use of radioactive tracers in meteorology, hydrology, etc., location of stations for measuring radioactivity of rainfall (use of existing meteorology stations) and, finally, preparation of a technical note and bibliography (continuing). *Subject Headings:* **1. Atomic energy meteorology 2. International cooperation in atomic energy meteorology 3. WMO atomic energy panel.**—*M.R.*

9C–22 551.510.721

Dunning, Gordon M. (*U. S. AEC, Div. of Biol. and Med.*), **Criteria for evaluating gamma radiation exposure from fallout following nuclear detonations.** *Radiology*, Syracuse, N. Y., 66(4): 585–594, April **1956.** fig., 5 graphs, 4 tables, 14 refs. **DLC** (RC78.A3)—Radiation effects of close-in and intermediate fallout are evaluated for an idealized fallout pattern, in terms of extent of damage to human beings. An example of the influence of weathering (rain and wind) on radiation dose rates is mentioned. Since this factor is not exactly predictable, the introduction of a generalized weathering coefficient into radiation dose calculations is suggested. *Subject Heading:* **1. Radioactive fallout computation.**—*G.T.*

9C–23 551.510.72

Dunning, Gordon (*U. S. Atomic Energy Commission*), **Immediate radiations from a nuclear detonation.** *Washington Academy of Sciences, Journal*, 47(6):189–194, June **1957.** 5 tables. **DLC**—Data are presented and discussed on the amounts of gamma exposure, neutron exposure and total nuclear exposure from air bursts of different magnitude (20 to 20,000 kilotons) at 30, 300 and 1000 mi from the detonation. Degrees of skin burns and times of delivery of thermal energy and blast wave are also tabulated. *Subject Heading:* **1. Thermonuclear explosion effects.**—*G.T.*

9C–24 551.510.721

Dwyer, L. J.; Keam, D. W.; Stevens, D. J. and Titterton, E. W., **Search for fallout in Australia from the Christmas Island tests.** *Australian Journal of Science*, Sydney, 20(2):39–41, Sept. **1957.** 2 figs., 2 tables, 2 refs. **DLC**—Radioactivity amounts measured in an Australian sampling network of 17 stations during a series of three H-bomb tests on Christmas Island are presented and discussed. The fallout radiation observed is found to be insignificant, highest fallout levels being far lower than the variations of natural background radioactivity. *Subject Headings:* **1. Radioactive fallout data 2. Australia.**—*G.T.*

9C–25 551.510.721:016

†Eisenbud, Merril; Harley, John H. and Hoard, Allen G., **Annotated bibliography on fall-out resulting from nuclear explosions.** *U. S. Atomic Energy Commission, [Report] NYO* 4753, Sept. **1956.** 44 p. 175 items. Also: Hoard, A. G.; Eisenbud, M. and Harley, J. H., **Annotated bibliography on long range effects of fallout from nuclear explosions.** [First supplement to the above], Nov. **1956.** 15 p. 60 items.—The 235 items in this bibliography (including supplement) cover international literature on various aspects of radioactive fallout, namely measurements of radioactivity in rainfall and dust, propagation of radioactive debris as related to atmospheric circulation, possible effects of atomic explosions on weather, biological effects of radiation, contamination of the sea, of fish, reservoirs, crops and food, identification of radio nuclides in atomic debris sampled from the air or from contaminated objects, etc. Most of the papers included have been published since 1949 (some unpublished speeches and reports are included), with considerable quantitative increase in 1954–1956. *Subject Heading:* **1. Radioactive fallout bibliographies.**—*G.T.*

9C–26 551.510.721

*Eisenbud, M. and Harley, J. H., **Radioactive fallout through September 1955.** *Science*, Wash., D. C., 124(3215):251–255, Aug. 10, **1956.** 2 figs., 2 tables, 9 refs. **DLC.** Also: *Latest fallout report. Science News Letter*, Wash., D. C., 70(8):118, Aug. 25, **1956. DWB, DLC, DGL**—This report gives the results of fallout measurements made at 62 of the 88 stations outside the U. S. and 26 stations inside continental U. S. since Oct. 1951. Data given are for mixed fission products (shown on map of world) and Sr^{90} (Mc/mi^2) as well as gamma dose (mrad). This is the first report that has given the total gamma dosage (average 10 mrad compared with 300 mrad from natural sources and cosmic rays in the same time [1951–55]). Highest accumulation was 740 mc at Grand Junction, Colo., and lowest was 33 mc at Lagos, Nigeria. The amount of Sr^{90} in milk in U. S. early in 1956 was about 3/1000 of what would be considered harmful. (*Same item as* 8.8–100, Aug. 1957, *MAB.*) *Subject Headings:* **1. Radioactive fallout data 2. Radioactive fallout networks 3. United States.**—*M.R.*

9C–27 551.510.721:551.501.9(73)

Eisenbud, Merril (*U. S. Atomic Energy Commission, N. Y.*), **The AEC fallout monitoring network.** *Air Pollution Control Association, Journal*, 6(3):144–146, Nov. **1956.** 3 figs., 2 tables, 2 refs. Reprinted from *American Water Works Association, Journal*, 48(6):659–664, June **1956. DLC**—Brings up to date earlier reports on radioactive fallout data obtained by U. S. Atomic Energy Commission monitoring network throughout the U. S. *Subject Headings:* **1. Radioactive fallout networks 2. Radioactive fallout data 3. United States.**—*G.T.*

9C–28 551.501.9:551.510.721(73)

Eisenbud, Merril, **Monitoring network for measuring radioactive fallout.** *American Water Works Association, Journal*, 48(6):659–664, June **1956.** fig., 2 tables, 2 refs. **DLC**—Problems of radioactive fallout propagation and monitoring are discussed. Percentage distribution of the principal isotopes 1 week, 1 month and 1 year after fission is shown in a table. The (gummed paper) method used in the U. S. fallout monitoring network is described and locations of the 89 stations in this network are listed. The dependence of fallout distribution on wind pattern is stressed. A chart is presented, showing cumulative fallout distribution (1951–1955) throughout the United States, with the lowest values found in California (22 μc/sq mile) and highest in Colorado (260 μc/sq mi.), Nevada being excluded because of the local fallout. *Subject Headings:* **1. Radioactive fallout networks 2. United States.**—*G.T.*

9C–29 551.510.721

Eisenbud, Merril (*U. S. AEC, N. Y. Operations Office*), **Global distribution of radioactivity from nuclear detonations, with special reference to strontium^{90}.** *Washington Academy of Science, Journal*, 47(6):180–188, June **1957.** 2 figs., 2 tables, 13 refs. Also same article under the title: **Global distribution of strontium-90 from nuclear detonations.** *Scientific Monthly*, 84(5):237–244, May 1957. **DLC**—The worldwide distribution of the Sr^{90} produced in weapons tests up to the present time can be expected to rise to approx. 20 millicuries per sq mi in the latter part of the next decade. Because of the chemical resemblance of Sr to Ca, Sr^{90} tends to be assimilated by plants, ultimately finding its way into foods and man, where the max. foreseeable deposition in humans will produce a radiation dose to the skeleton that will be about 2.3 reps in a lifetime of 70 yrs. This estimate is based on conservative assumptions, and in all probability the actual dose will be considerably less, possibly as low as 0.23 rep. The dose in the U. S. from natural radioactivity, to which humans have always been exposed, ranges from 7 to 30 reps in 70 yrs. The highest estimate of the skeletal dose that can be foreseen from devices detonated to date is thus 7% of the upper values of the dose delivered by natural radioactivity and may prove to be as little as 0.7%. *Subject Headings:* **1. Radioactive fallout 2. Strontium^{90} global distribution 3. Thermonuclear explosion effects.**—*Author's summary.*

9C–30 551.582:551.552:551.510.721

*Eklof, Theodore H., **Fall-out wind roses for China-Japan-Philippines, the United States-Canada-Mexico and Siberia-Alaska. . . .** *U. S. Air Force. Tactical Air Command, Operations Analysis Memorandum*, No. 106, March **1957.** 25 p. 13 figs., 4 tables. **DAWS**—Seasonal wind speed and direction frequency data are tabulated for 23 regions in the Far East, North America and Siberia. A three-layer fallout model for megaton weapons is applied to these wind frequency data, and the resulting fallout percentage frequencies are presented on charts for each region, in the form of fallout roses. *Subject Headings:* **1. Fallout wind roses 2. Radioactive fallout computation 3. China 4. Japan 5. Philippines 6. United States 7. Mexico 8. Canada 9. Siberia 10. Alaska.**—*G.T.*

9C–31 551.510.721:627.1(741)

Eliassen, Rolf and Lauderdale, Robert A. (*both, M.I.T.*), **Radioactive fallout in water supply at Portland, Me.** *American Water Works Association, Journal*, 48(6):665–670, June **1956.** fig.,

3 tables, 2 refs. **DLC** —From Feb. 11 to June 24, 1955, a period of weapons testing, radioactivity (gross β-activity and radiostrontium activity) was measured in the water of Lake Sebago (the source of water for the Portland, Me., Water District), in snow on the frozen lake and in tap water. Results of the measurements are tabulated. Fission products were found to be present in quantities below maximum permissible levels by large factors. *Subject Headings:* **1. Radioactivity in water supply 2. Portland, Maine.**—*G.T.*

9C–32 662.2:539.1:551.5

Faust, H., **Waren Atombombenexplosionen schuld am verregneten Sommer?** [Were atomic explosions responsible for the rainy summer?] *Naturwissenschaftliche Rundschau*, Stuttgart, 9(11):445–446, Nov. **1956. DLC**—Atomic explosions cannot produce any large-scale weather effect through the energies released, or through radiation absorption by debris, or action of radioactive particles as condensation nuclei. In refusing to hold atomic explosions responsible for unusual weather, meteorologists, motivated by scientific truthfulness—not any kind of bias, least of all a political one—are depriving themselves of a convenient explanation for some of their forecast failures. *Subject Heading:* **1. Atomic explosion effects on weather.**—*G.T.*

9C–33 662.2:539.1:551.5

Fedorov, E. K., **O vliianii atomnykh vzryvov na meteorologicheskie protsessy.** [Influence of atomic explosions on meteorological processes.] *Atomnaia Energiia*, Moscow, 1(5):103–112, **1956.** Trans. into English by R. H. Ponting in *Journal of Nuclear Energy (Including the Soviet Journal of Atomic Energy)*, issued London, Pergamon Press, 5(1):135–145, **1957.** table, 27 refs. **DLC.** Also trans. into English in: *Soviet Journal of Atomic Energy* (Consultants Bureau, Inc.), N. Y., No. 5:779–788, **1956.** table, etc.—The physical effects of atomic explosions on meteorological elements in the earth's atmosphere are considered. An analysis of the evidence shows that the thermodynamic effect of an explosion is insignificant, and cannot affect meteorological processes materially. Some changes of weather might result indirectly from a substantial modification of the electrical properties of the atmosphere and from the corresponding increase in condensation. To an order of magnitude, any such effects on the weather are comparable with those brought about by the periodic fluctuations in solar activity. *Subject Heading:* **1. Thermonuclear explosion effects on weather.**—*Author's abstract.*

9C–34 551.510.721

Ferber, G. J.; Quennesville, L. R. and Reiss, G. W., **Evaluation of a simple technique for routine fallout determination.** U. S. Weather Bureau Manuscript, Wash., D. C., Aug. **1957.** 32 p. 2 figs., 11 tables, 9 refs. **DWB**—The U. S. Weather Bureau currently transmits twice-daily upper-air fallout (UF) winds. Since the UF approach neglects the time and space variations of the wind, two simple modifications of this approach are proposed to partially overcome this deficiency. Standard particle trajectories applicable to a particular weather situation have been developed to evaluate the UF technique and the proposed modifications. The comparative results are presented. *Subject Heading:* **1. Radioactive fallout computation.**—*Authors' abstract.*

9C–35 551.510.721

Fields, P. R. et al., **Transplutonium elements in thermonuclear test debris.** *Physical Review*, 102(1):180–182, April 1, **1956.** 2 figs., table, 11 refs. **DLC**—The isotopes of curium, berkelium, and californium found in the thermonuclear debris of the Nov., 1952 thermonuclear test are discussed The instantaneous buildup of the heavy elements in the thermonuclear device is compared with the buildup during pile irradiation. The alpha-particle energy (5.4 Mev) and the spontaneous fission half-life ($<1.2\times10^7$ years) of Cm^{246} are reported. The spontaneous fission half-life of Cf^{254} was found to be 55 days. No other mode of decay was observed for this isotope. *Subject Heading:* **1. Radioactive fallout composition analysis.**—*Authors' abstract.*

9C–36 551.510.721

Fitzgerald, J. J., **Determination of radioactive fall-out.** Issued by Knolls Atomic Power Laboratory (General Electric Co.), Schenectady, under Contract W-31-109-Eng-52, as *U. S. Atomic Energy Commission*, [*Reports*] *KAPL*-1439, Feb. 9, **1956.** 25 p. 3 figs., 5 eqs., 15 refs. **DWB** (539.752 F553d). Also in: *Eastern Snow Conference, Proceedings*, Vol. 4 (1956 and 1957 Meetings), issued **1957**(?). P. 26–30.—The origin, the quality, and the quantity of radioactive materials that may be discharged into the atmosphere are discussed. A distinction is made between deposition of activity on the ground by surface absorption, fall-out, wash-out, and rain-out. The rate of deposition from wash-out is a factor of 4 to 20 times the rate of deposition during fall-out under similar circumstances. Rain-out deposition at a distance of one mile from the point where the activity is dispersed is a factor of 1000 greater than wash-out deposition. A formula for determining the accumulated external dose from the maximum deposition is given and is in good agreement with experimental data. *Subject Heading:* **1. Radioactive fallout computation.**—*Author's abstract.*

9C–37 551.509.58:551.510.7:681.14:35

Frenkiel, François N. (*Applied Physics Lab., Johns Hopkins Univ., Silver Spring, Md.*), **Radioactive pollution and civil defense.** *Washington Academy of Sciences, Journal,* 46(7):206–210, July **1956.** 4 refs. **DLC, DGL**—Usefulness of high speed computing techniques during periods when the synoptic forecaster indicates danger from high concentrations of pollutants is discussed and applied to the Los Angeles case and to the Wash., D. C. area for civil defense (against radioactive pollution) operations. The problems of defense against actual fallout is different from the problem of defense against a probable attack involving risk of moving the population into instead of out of a hazardous area. In any event, rapid communications and data integration are essential so correct decisions can be made. A number of computing centers should be established throughout the country. (*Same item as* 8.8–101, Aug. 1957, *MAB.*) *Subject Headings:* **1. Civilian defense 2. Radioactive pollution forecasting 3. Electronic computers for fallout forecasting.**—*M.R.*

9C–38 551.510.72

Garrigue, H., **Propagation à grande distance et caractéristiques des particules radioactives issues des explosions atomiques.** [Propagation over great distances and properties of radioactive particles from atomic explosions.] *La Semaine des Hopitaux,* Vol. 32, *Pathologie et Biologie,* No. 7: P. et B., 450–451 (i.e., *Annales de la Recherche Médicale,* No. 3: R.M. 146–147.) April **1956.** (Also in: **L'Énergie atomique dans ses répercussions sur la vie et la santé.** [Atomic energy in its repercussions on life and health.] Ed. by F. Biquard. pub. Paris, L'Expansion, **1956.** p. 43–47.) **DNLM**—Since 1946 radioactivity has been measured in France at various points on the ground and in airplanes at altitudes up to 8500 m. It was attempted to measure the type, amount and rate of propagation of radioactive particles from nuclear explosions. The average speed is found to be 20 to 60 km p.h.; values of 100 km p.h. or more may be reached over short distances (5000–10,000 km). Generally the pollution does not now exceed 1 beta-emitting atom per cu. cm of atmosphere for radioactive products with maximum half-lives of 60 days. The captured particles may be very small in size. *Subject Headings:* **1. Radioactive fallout propagation 2. France.**—*Trans. of author's abstract.*

9C–39 551.510.42:623.454.8:551.578.8

Garrigue, Hubert, **Radioactivité de l'air et des précipitations.** [Radioactivity in the air and in precipitation.] *Académie des Sciences, Paris, Comptes Rendus,* 243(6):584–585, Aug. 6, **1956** table. **DLC**—Since May 31, 1956 [up to July 18] all precipitation at the Puy-de-Dôme summit has been polluted with radioactive fission products. This is confirmed by a sampling in flight on June 15. (*Same item as* 8.7–148, July 1957, *MAB.*) *Subject Headings:* **1. Radioactivity in precipitation 2. Puy-de-Dôme, France.**—*Trans. of author's abstract.*

9C–40 551.510.7:551.508.9

Garrigue, Hubert, **Nouvel équipement pour l'étude du nuage radioactif.** [New equipment for the study of radioactive cloud.] *Académie des Sciences, Paris, Comptes Rendus,* 244(17):2249–2251, April 24, **1957. DWB**—Simple radioactivity counter equipment mounted on a light car is described. The main parts are a Geiger counter, an amplifier and a battery (charged by the car generator). The error of measurement is between 5 and 15%. In the course of preliminary measurements β and γ activity originating in fission products was detected. Also β activity was found in samples several years old. *Subject Headings:* **1. Radioactivity measurement 2. Radioactivity in clouds.**—*G.T.*

9C–41 551.510.

Gedeonov, L. I., **Radioaktivnoe zagriaznenie atmosfery.** [Radioactive contamination of the atmosphere.] *Atomnaia Energiia,* Moscow, 2(3):260–271, March **1957.** 8 figs., 75 refs. **DLC**—Trans. into English in *Soviet Journal of Atomic Energy* (Consultants Bureau, Inc.), N. Y., 2(3):313–325, **1957.** 8 figs., etc. **DLC**—This article is a review of foreign works on the study of radioactive contamination of the atmosphere due primarily to diffusion of fission fragments from atomic tests. Several properties of fission fragment activity, namely its decay rate and the composition of its radiation, are considered, and methods are described for monitoring the fallout from the atmosphere and calculating the resulting radiation dose. The dose is almost everywhere much less than the permissible limit. At several places, however, fallout densities and activity concentrations are observed which are close to the allowable limit. A method for constructing the trajectories of air masses is briefly described, and it is shown that radioactive clouds migrate over the whole world producing a radioactive layer in the atmosphere at an altitude of 8–12 km consisting primarily of the long-lived nuclides Sr^{90}, Ce^{144}, and Pu^{229}. Of the fission fragments contaminating the earth's surface the most dangerous is Sr^{90} which has the property that it accumulates in the organism of domesticated animals and thus enters the human organism. The radiation level at points far from the test areas is at present far below the allowable limit in the sense of the possible occurrence of

somatic diseases, although even at the present radiation level, effects on posterity cannot be excluded. *Subject Heading:* **1. Radioactive fallout propagation.**—*Author's abstract.*

9C–42 551.510.7:551.577.7

*Gerlach, Walther, **Untersuchungen über radioaktive Regen.** [Investigation of radioactive rain.] *Atomkernenergie*, Munich, 1(7/8):237–244, July/Aug. **1956.** 15 figs., 8 tables. Also Gerlach, Walther and Stierstadt, Klaus, **Untersuchungen über radioaktive Niederschläge, II.** [Investigation of radioactive precipitation, Pt. 2.] *Ibid.*, 2(5):161–167, May **1957.** 12 figs., 4 tables. Also Gerlach, W.; Stierstadt, K. and Zeising, Ilse, **Untersuchungen über radioaktive Niederschläge, Pt. 3.** *Ibid.*, 2(11/12):438–443, Nov./Dec. **1957.** 10 figs., table. **DLC**—Radioactivity in rain water has been measured in Munich since April 1955. Results of the measurements are presented and discussed in these papers. The method of measurement (β-activity measurement in residual matter after evaporation of rain water) is described. Decay curves and results of chemical analyses are included. Measured radioactivities are correlated with dates of atomic explosions. Observed values suggest that permissible levels of radiation might be exceeded through prolonged use of rainwater for drinking purposes. *Subject Headings:* **1. Radioactivity in rainwater 2. Munich, Germany.**—*G.T.*

9C–43 551.510.7:551.501

Gersht, E. P., **Ob ispol'zovanii radioaktivnykh izotopov v meteorologii i gidrologii.** [On the use of radioactive isotopes in meteorology and hydrology.] *Meteorologiia i Gidrologiia*, Leningrad, No. 8:62–64, **1957.** 13 refs. **DWB, DLC**—Extensive notes on properties of radioactive neutrons or tritium in the atmosphere and their use as tracers of air or water currents; ionization anemometers used in Soviet Arctic for measuring dew, absolute humidity, pressure, snow cover density, depth of water in rivers, lakes and rain gages; soil moisture measurement, especially under snow cover or in frozen ground; water content of clouds, turbulent motion and a number of other meteorological or hydrological problems requiring automatic or distant recording. Reference is made to both Russian and western literature. *Subject Headings:* **1. Radioactive isotopes 2. Radioactive tracer techniques.** —*M.R.*

9C–44 551.510.721:551.510.41:551.509.58

Gilbert, G. H., **Fall-out from large nuclear explosions with applications to civil defence.** *Canada. Defence Research Board, ORG Memorandum*, No. 55/6, March 6, **1955.** 18 p. 6 figs., 3 charts, 4 tables, 5 refs. **DWB**—Many aspects of atomic or nuclear fallout, prediction of patterns and intensities, and protective measures against radiation hazards are covered in this series of notes and diagrams for use in Canada. Some of the subjects covered are formation of nuclear cloud, fallout from a particular level, time of arrival, variation of wind with altitude, wind aloft data for Canada (5 stations for 4 seasons) up to 80,000 ft, prediction of patterns from synoptic charts and supplementary nomograms and, finally a U. S. Atomic Energy Commission report on hazards of fallout, etc. (*Same item as* 8.7–330, July 1957, *MAB.*) *Subject Headings:* **1. Radioactive fallout pattern forecasting 2. Upper air winds 3. Canada.**—*M.R.*

9C–45 551.510.7:612.6

Graul, E. H. (*Marburg, Germany*), **Stellungnahme der deutschen Ärzteschaft zu den aktuellen Fragen der Schädigungen durch ionisierende Strahlen.** [Statement of the German medical profession on current problems of damage by ionizing radiation.] *Atompraxis*, Karlsruhe, 3(10):409–412, Oct. 1957. Includes his, **Ansatzpunkte eines Versuches zur ärztlichen Beurteilung der Strahlungsgefährdung des Menschen im sog. "Atomzeitalter."** [Tentative medical assessment of the radiation hazard to man in the so-called atomic age.] p. 410–411. **DLC**—At a general meeting of the German Federal Chamber of Medicine a discussion was held concerning protection of the population against harmful effects of atomic radiation. This report includes a brief account of the discussion, the text of the resolution adopted (stressing the need for intensified research and cooperation), and the author's remarks in his capacity of the German Chamber of Medicine's technical advisor on nuclear medicine and radiobiology. Problems connected with ionizing radiation from various sources, natural and artificial (half of the biological load from the latter being due to medical practices) are reviewed, including the contribution of fallout. *Subject Headings:* **1. Biological effects of radioactivity 2. Radioactive fallout hazard.**—*G.T.*

9C–46 551.510.72:551.574.1:662.2:539.1

Greenfield, S. M. (*Rand Corp., Santa Monica, Calif.*), **Ionization of radioactive particles in the free air.** *Journal of Geophysical Research*, Wash., D. C., 61(1):27–33, March **1956.** 3 refs., 9 eqs. **DLC**—In order to evaluate the possible role of radioactive particles from an atomic cloud as condensation nuclei, an analysis has been made to determine their degree of ionization. Individual radioactive particles become ionized due to β emission, and an estimate of the half-life of these ions has been made for various times in the life history of an atomic cloud. It is concluded that while

there is a transient charge on these particles, its half-life is small compared to the disintegration rate, with the result that for all practical purposes radioactive particles in the free air are not necessarily preferred condensation nuclei. (*Same item as* 8.1–383, Jan. 1957, *MAB.*) *Subject Headings:* **1. Radioactive condensation nuclei 2. Atomic explosion effects.**—*Author's abstract.*

9C–47 551.510.7

*Greenfield, S. M.; Rapp, R. R. and Walters, P. A., **Catalog of fallout patterns.** RAND Corporation, Santa Monica, Contract At (11)-135, Research Memorandum RM-1676-AEC, April 16, **1956.** 93 p. 14 p. of text+figs. (mostly fold.). **DWB** (539.752 R186c)—In the event of a massive nuclear attack, the combined fallout from quantities of surface-burst nuclear weapons must be considered as a serious hazard over an extended area. This report presents one method for rapidly estimating the fallout from such an attack. It is essentially an analog method and consists of 26 carefully computed fallout patterns together with instructions for matching them approximately to a given yield and wind condition. A brief outline of the basic computational model is given, and possible sources of errors of estimates are discussed. *Subject Heading:* **1. Radioactive fallout computers.**—*Authors' abstract.*

9C–48 551.510.42:623.454.8:551.578.11

Greenfield, S. M., **Rain scavenging of radioactive particulate matter from the atmosphere.** *Journal of Meteorology*, 14(2):115–125, April **1957.** 8 figs., 9 refs., 23 eqs. **DWB**—Langmuir's "collection efficiency" of a falling raindrop is modified to take account of density of radioactive particles and fraction scavenged out of a cylinder of diameter of largest drop. Graph shows percent of particles of given diameter scavenged from cloud as a function of rainfall rate and duration. Particles $<2\mu$ diameter are removed in only minute amounts, but some coagulate with cloud droplets which are subsequently collected by rain drops. Fractions picked up by droplets of 20μ diameter in turbulent clouds of liquid water content 0.4×10^{-6} gm/cm^3 are graphed. It is found that total fraction scavenged depends on depth of rainfall and not on intensity; fractions removed by rainfalls up to 20 mm are plotted. (*Same item as* 8.8–102, Aug. 1957, *MAB.*) *Subject Headings:* **1. Atomic explosion products 2. Rain removal of radioactive products.**—*C.E.P.B.*

9C–49 551.510.721

Halpine, Charles Greham and Taylor, Halton H., **A mariner's meteorology.** Princeton, N. J., D. Van Nostrand, **1956.** p. 306–318, **Radioactive fallout.** 3 diagrs. **DLC** (QC994. H25)—This section of the textbook contains information, taken from U. S. Federal Civil Defense Administration publications, on the nature of fallout, characteristics of an H-bomb explosion (diagram), formation of the fallout cloud, the fallout pattern (diagrams), duration of fallout, radiological contamination, and decontamination. The problems discussed do not include stratospheric retention of atomic debris or worldwide radioactive contamination. (For abstract of the book, *see* 8.5–6, May 1957, *MAB.*) *Subject Headings:* **1. Radioactive fallout data 2. Textbooks 3. Civilian defense.**—*G.T.*

9C–50 551.501.9:551.510.7

*Harley, John H.; Hardy, Edward P., Jr.; Welford, George A.; Whitney, Ira B. and Eisenbud, Merril, **Summary of analytical results from the HASL strontium program to June 1956.** *U. S. Atomic Energy Commission (Report) NYO*-4761, Aug. 31, **1956.** 9 p. 4 figs., 13 tables, refs. (Reprinted in Congressional Subcommittee Report (9C–166), p. 591–610.) Also: . . . **July through December 1956.** *Ibid., NYO*-4862, March 15, **1957.** 44 p. 14 tables, 7 figs., 4 refs. **DLC**—Results of radioactive fallout sampling and analysis are reported for the worldwide network maintained by the U. S. Atomic Energy Commission's Health and Safety Lab., and maps are presented, showing estimated Sr^{90} radioactivity levels for the U. S. and for the world. Fallout samples were obtained by the gummed paper method (accuracy and corrections applied are discussed) and Sr^{90} amounts were computed from total radioactivity and dates of explosions. In addition to these global fallout data the reports also contain discussions and data of some special projects, such as the Pasture Program, the New York city monitoring program (fallout, tap water, milk, etc.), and analysis of samples of fish, vegetation, soil, rainwater and human bones. *Subject Headings:* **1. Radioactive fallout networks 2. Strontium^{90} global distribution 3. Radioactive fallout data. I. U. S. Atomic Energy Commission. Health and Safety Laboratory.**—*G.T.*

9C–51 551.510.42:551.510.721

Haxel, O. and Schumann, G., **Selbstreinigung der Atmosphäre.** [Self-purification of the atmosphere.] *Zeitschrift für Physik*, Berlin, 142(2):127–132, **1955.** table, 12 refs., 7 eqs. **DLC**—A method is described for computing the length of period during which aerosol particles stay in the atmosphere. The method is based on measurement of natural radioactivity (corrected for fission-product radioactivity) attached to the particles. It is shown that aerosols stay in the atmosphere for periods of the order of a few days. From fission-product radioactivity measurements, on the

other hand, it appears that particles will stay in upper atmospheric layers for several months. Aerosols, however, probably can reach such altitudes only by high-energy transport, like in the case of volcanic eruptions or atomic explosions. *Subject Headings:* **1. Aerosol deposition 2. Radioactive fallout propagation.**—*G.T.*

9C–52 551.510.42:551.510.721

Herbst, W. and Sommermeyer, K., **Uber die γ-Spektren des radioaktiven Befalls aus der Atmosphäre.** [On the γ spectra of the radioactive fallout from the atmosphere.] *Naturwissenschaften*, 44(14):392, July 15, **1957.** fig. **DWB**—To determine how far the radioactivity of vegetation is absorbed from the soil or by fall from the air on the plant, γ spectra were compared of dust-collecting sheets exposed to the air for 8 days, and grass ash. They were similar. (*Same item as* 8.10–84, Oct. 1957, *MAB.*) *Subject Heading:* **1. Radioactive fallout.**—*C.E.P.B.*

9C–53 551.510.721

*Herbst, Walter; Langendorff, Hanns; Philipp, Kurt and Sommermeyer, Kurt (*Freiburg, Brsg.*), **Untersuchungen über die Radioaktivität der Vegetation.** [Investigation of the radioactivity of vegetation.] *Atomkernenergie*, Munich 2(10):357–367, Oct. **1957.** 9 figs., 3 tables, 21 refs. Review in *Naturwissenschaftliche Rundschau*, 11(1):26–27, Jan. **1958. DLC**—The research whose results are presented in this report was concerned with measurement of β-activity (in some cases α and γ activity) measured in incinerated plants, radiochemical analyses, and comparison with radioactivity measured in atmospheric dust. Most of the radioactivity measured in plants was found to result from fission products, and to settle on the plant surfaces from the atmosphere rather than being absorbed from the soil. *Subject Headings:* **1. Radioactivity in plants 2. Radioactive fallout data.**—*G.T.*

9C–54 551.508.9:551.577.7

Hinzpeter, A., **Ionenaustauscher-Verfahren zur Messung kleiner β-Aktivitäten von Regen.** [Ion exchanger technique for measurement of small β activity in rain.] *Naturwissenschaften*, 44(23):611–612, Dec. 1, **1957.** fig. **DLC**—An apparatus is described for separating radioactive substances by drawing rain water through resinous filters. The lengthy conventional process of rainwater vaporization is eliminated by this method. A diagram of the apparatus is presented. *Subject Heading:* **1. Radioactivity measurement techniques.**—*G.T.*

9C–55 551.510.7

Hofmann, Alfred, **Die Ausbreitung radioaktiven Staubes über die Erde.** [Spread of radioactive dust over the globe.] *Kosmos*, Stuttgart, 52(12):589–593, Dec. **1956.** 5 figs., 2 refs. (Also in: Braunbek, W. et al., **Gefährliche Strahlen.** [Dangerous radiation.] Stuttgart, Kosmos, **1957.** p. 88–100.) **DLC**—After discussing the meteorological parameters involved in the atmospheric propagation of fission products, the author briefly describes the sampling activities introduced or planned by the German weather service. Measurements are made with Geiger counters. Precipitation radioactivity is being measured at Freiburg i. Br. and Heidelberg. Ten stations are being equipped gradually for measuring radioactivity in the surface layer of the atmosphere. It is also planned to measure radioactivity in particles in the free atmosphere and those deposited on the ground. There is no method available for predicting the deformation and propagation of radioactive clouds. *Subject Headings:* **1. Radioactive fallout networks 2. Germany.**—*G.T.*

9C–56 551.510.71:69

†Hultqvist, Bengt, **Studies on naturally occurring ionizing radiations with special reference to radiation doses in Swedish houses of various types.** *Svenska Vetenskapsakademien, Stockholm, Handlingar*, Ser. 4, 6(3), **1956.** 125 p. 52 figs. (incl. photos.), 22 tables, bibliog. p. 114–125, 81 eqs. **DWB**—In this comprehensive survey of atmospheric radioactivity research since its beginnings in 1901, physical and biological aspects of the field are reviewed, using some 400 sources from world literature on the subject. Drawing generously on tabular and graphical data and theories contained in the literature quoted, the sources, amount, modification and effects of various types of gamma, beta and atmospheric corpuscular radiation are analyzed. Methods of measurement and instrumentation are described. Radiation effects in the human body are discussed in considerable detail. A great deal of original data obtained in dwellings in Sweden are presented and commented on. These include measurements of gamma ionization in 986 apartments made of different building materials (with recorded values ranging between 4 and 38 ion pairs/cm³ sec), data on radon and thoron content in 61 dwellings and 26 cellars, and radon equivalent in 287 apartments (recorded radon contents between 0.03 and 50.10^{-15} curie/cm³). (*Same item as* 8.7–19, July 1957, *MAB.*) *Subject Headings:* **1. Radioactivity in houses 2. Sweden.**—*G.T.*

9C–57 551.510.721

Il'in, D. I. and Moskalev, Iu. I., **K voprosu ob obmene tsesiia, strontsiia i smesi β-izluchateleĭ u korov.** [Metabolic exchange of cesium, strontium, and a mixture of β-emitters in cows.] *Atomnaia*

Energiia, Moscow, 2(2):163–168, Feb. **1957.** 4 figs., 2 tables, 5 refs. **DLC.** Trans. into English in *Soviet Journal of Atomic Energy* (Consultants Bureau, Inc.), N. Y., 2(2):183–188, **1957.** 4 figs., etc. **DLC**—Presents results of an investigation of the distribution and excretion of the readioactive isotopes Cs ^{137}, $Sr^{89,90}$, and of a mixture of β-emitters in 6 cows after peroral administration. It is shown that cesium and strontium are resorbed well from the intestines and that a considerable portion of the amount of emitters resorbed is excreted into milk. Resorbed cesium is almost exclusively deposited in the muscles, while strontium is in the skeleton. The results of the work indicate the danger of widespread application of radioactive fertilizers and of the maintenance of cows in pastures contaminated by the radioactive particles resulting from fission. The results can be used in calculating the maximum permissible contents of cesium, strontium, and mixtures of β-emitters in products intended for feeding cows. *Subject Headings:* **1. Isotopes in cows 2. Strontium^{90} in cows.**—*Authors' abstract.*

9C–58 662.2:539.1:551.510.721

India. Defence Science Organization, **Nuclear explosions and their effects.** Foreword by Jawaharlal Nehru. Delhi, **1956.** 184 p. figs., tables, foot-refs., map. Price: $1.00. **DLC** (UF767.I45)—Knowledge on physical and biological effects of nuclear explosions is summed up with a fair amount of technical detail included. On p. 95–143, propagation mechanisms of the different types of fallout, the hazards resulting from global fallout, and possible effects of nuclear explosions on weather are reviewed and pertinent literature is cited. *Subject Headings:* **1. Thermonuclear explosion effects 2. Radioactive fallout. I. Nehru, Jawaharlal.**—*G.T.*

9C–59 551.510.721

International Review Service, N. Y., **Radiation hazards: atoms-for-peace and weapons tests. International action for control and limitation.** Its [*Publications*], No. 8, **1956.** 29 p. 31 refs. Price: $2.50.—International problems arising from nuclear tests and contamination by radioactive fallout are reviewed with particular attention to the establishment (Dec. 3, 1955) and activity of the U. N. Scientific Committee on the Effects of Atomic Radiation. Facts about delayed fallout and contamination by Sr^{90} are summed up on the basis of American, British and Japanese reports. *Subject Headings:* **1. Radioactive fallout 2. U. N. Scientific Committee on the Effects of Atomic Radiation.**—*G.T.*

9C–60 551.510.72(52)

Ishii, C.; Maeda, K.; Suda, T. and Arai, Y., **Observation of radioactive contamination in the upper atmosphere.** (In: Japan. Committee for Compilation of Report on Research in the effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:115–120. 4 figs., table, 13 refs.) **DLC** (UF767.J32)—Radioactivity in the upper air (up to 16 km) was measured over Tateno and Tokyo in four balloon ascents and two airplane flights. The gamma-detector instrumentation (a set of specially arranged G-M counters) and method used are described in detail. Curves showing the vertical radioactivity distributions obtained (corrected for cosmic-ray effects) are presented. Adaptation of the apparatus to measurement at higher altitude is under consideration. *Subject Headings:* **1. Radioactivity in upper atmosphere 2. Air-borne radioactivity measurement 3. Bikini H-bomb tests, 1954 4. Japan.**—*G.T.*

9C–61 551.594.1/2

†Israël, Hans, **Die atmosphärische Elektrizität im Rahmen der Meteorologie. (Probleme und Methoden der luftelektrischen Forschung und ihre Bedeutung für den Wetterdienst.)** [The place of atmospheric electricity in meteorology: problems and methods of atmospheric electric observation and its importance for the Weather Service.] *Meteorologische Rundschau*, Berlin, 9(5/6):80–84, May/June **1956.** 4 figs., 25 refs. **DLC**—The importance of atmospheric electricity to meteorology is threefold. Weather is always accompanied by electrical effects—potential gradient, vertical current and conductivity in the Alps are compared with aerosol distribution, as shown by synoptic studies. Sferics are related to the pre-thunder stage and observations should be resumed in Germany. Radioactivity of the atmosphere is of practical interest in austausch problems, especially since atomic explosions began. Measurements in U. S. suggest that artificial radioactivity may rival natural radioactivity, and suggestions are made for warnings and investigations. (*Same item as* 7.10–289, Oct. 1956, *MAB.*) *Subject Headings:* **1. Atmospheric electricity effects 2. Atomic explosion effects.**—*C.E.P.B.*

9C–62 551.594:551.510.7

Israël, Hans, **Atmosphärische Elektrizität, Teil 1, Grundlagen, Leitfähigkeit, Ionen.** [Atmospheric electricity, Vol. 1, Fundamentals, conductivity, ions.] Leipzig, Akademische Verlagsgesellschaft Geest & Portig, **1957.** 370 p. 124 figs., 41 tables, 317 eqs., bibliog. p. 327–366. **DLC** (QC961.179) —In this comprehensive text on atmospheric electricity the subjects of natural and

artificial radioactivity, and atmospheric ionization by radioactive substances and cosmic rays are treated in Chapters 45–51 (p. 220–237, fig., 5 tables, eqs., refs.). Values of atmospheric radon content at different locations (continents and oceans) are listed from some 30 different sources (the table includes place and time of measurement, author, number of measurements, average, maximum and minimum radon content). The height distribution of natural radioactive substances, and ionization by gamma rays and by cosmic rays are discussed, and an ionization balance is set up for the lower atmospheric layers over land and over oceans. After considering the contribution of fission-product radioactivity to the amount of atmospheric ionizing radiation, the author concludes that 1) without special effects of cumulation the fission-product radiation is far below the natural radiation level over land but comparable to it over the open sea; 2) in cases of special cumulation the natural ionization may be doubled or multiplied by the presence of fission products. (For abstract on the whole book *see* 9.3–4 in this issue.) *Subject Headings:* **1. Atmospheric electricity textbooks 2. Radioactivity in the atmosphere.**—*G.T.*

9C–63 551.594(02)

Israël, Hans, **Luftelektrizität und Radioaktivität.** [Atmospheric electricity and radioactivity.] Berlin, Springer Verlag, **1957.** 125 p. 86 figs., 6 tables, foot-refs.—This small up-to-date book contains 6 chapters on: I. General and instrumental aspects of atmospheric electricity; II. Physical and molecular aspects (ionization of gases); III. Aerosols (small ions, large ions, condensation nuclei, aerosols and weather); IV. Atmospheric electricity fields and currents due to turbulent exchange, thunderstorms or precipitation; V. Theory and application of atmospheric electricity fields and currents, climatological and synoptic and macroaspects; VI. Thunderstorm electricity (lightning and charge formation sferics); VII. Radioactive ionization, natural and artificial radioactivity in the atmosphere and VIII. Biological aspects of atmospheric electricity. A good subject index is provided. The book contains some data and numerous schematic diagrams. (*Same item as* 8.9–5, Sept. 1957, *MAB.*) *Subject Headings:* **1. Atmospheric electricity textbooks 2. Radioactivity in the atmosphere 3. Thunderstorm electricity.**—*M.R.*

9C–64 551.510.71

Israël, Hans, **Das natürlich-radioaktive Milieu unserer Umwelt.** [The natural radioactivity of our environment.] *Naturwissenschaftliche Rundschau,* 10(7):249–252, July **1957.** 2 figs., 6 tables. **DWB**—Natural radioactive substances belong mainly to the series Uranium 238 and 235 and Thorium 232, each of which includes a gaseous emanation which diffuses in soil air and into atmosphere ("exhalation"). The cycle is set out quantitatively, including height distribution to 5 km (radon, alpha and beta + gamma radiation). (*Same item as* 8.11–115, Nov. 1957, *MAB.*) *Subject Heading:* **1. Radioactivity in the atmosphere.**—*C.E.P.B.*

9C–65 551.510.71

Jacobi, W.; Aurand, K. and Schraub, A., **Über das Verhalten natürlich radioaktiver Substanzen in der Atmosphäre. (Erweiterte Zusammenfassung.)** [Retention of natural radioactive substances in the atmosphere (extended summary).] *Annalen der Meteorologie,* 8(1/2):63, **1957. DWB**—Radioactive measurements were made with 2 ten-liter ionization chambers (one for comparison). These showed that for radiation load on breathing tracts the short-lived products of radon are responsible. Within 10 m of the ground they are not in equilibrium with radon. In the upper ground layer long-lived products (Ra D, Ra E, Polonium) accumulate. *Subject Heading:* **1. Radioactive emanations.**—*C.E.P.B.*

9C–66 551.510.721:551.577.7(52)

†Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, Japan. Society for the Promotion of Science, **1956.** 1824 p. 2 vol. figs., tables, foot-refs., bibliogs., eqs. **DLC** (UF767.J32). Review in *Science,* 125(3249):654, April 5, **1957.**—This voluminous report is a collection of over 300 papers reporting results of observations and measurements made by Japanese scientists in connection with Pacific thermonuclear bomb tests in the spring of 1954. The papers cover a variety of disciplines and are grouped in the following 8 Sections: Meteorology (p. 1–417, 39 papers), Physics, Chemistry, Genetics, Agriculture, Fisheries, Economics, Medicine (the last three are in vol. 2). Most of the papers in the section on meteorology report results of radioactivity measurements carried out in Japan (separate reports for each place of measurement) in 1954 and 1955. They contain description of the method of collection and measurement (usually evaporation of water collected on polyvinyl sheet and measurement with G-M counter), tabular and graphical presentation of the day-by-day values measured, decay and absorption curves of selected samples, results of radiochemical analyses (radionuclides identified), and identification of sources of origin (tests at the Bikini and Nevada sites and in the U.S.S.R.). Other papers in this Section deal with upper air phenomena affecting the propagation of radioactive debris. Contents of the Sections

Meteorology, Physics and **Chemistry** are listed in this issue on p. 375. Abstracts of individual papers of meteorological interest are included in this bibliography. *Subject Headings:* **1. Atomic explosion effects 2. Radioactive fallout analysis 3. Bikini H-bomb tests, 1954 4. Radioactive fallout data 5. Japan 6. Pacific Ocean.**—*G.T.*

9C–67 551.510.7

†Jech, Čestmír, **Radioaktivní aerosoly.** [Radioactive aerosols.] *Chemické Listy*, Prague, 49(4):577–614, April **1955.** 19 figs., table, 88 refs. **DLC** (QD1.C6884)—This thorough review of Czechoslovak and western literature covers the following aspects of radioactivity research: size and other properties of liquid and solid radioactive particles; formation and occurrence of natural and artificial radioactivity in the atmosphere; methods of measurement (capturing, sedimentation, filter, electrostatic, impaction and other methods of sampling; and methods of measuring the size, radioactivity and other properties of the particles); effects of radioactive matter inhaled or taken in food; permissible levels of concentration; protective measures; production and propagation of radioactive debris from nuclear explosions; and fallout radioactivity measured in different (western) countries. Genetic and other harmful effects of radioactive fallout are discussed. *Subject Headings:* **1. Radioactive aerosols 2. Thermonuclear explosion effects 3. Czechoslovakia 4. Western Europe.**—*G.T.*

9C–68 662.2:539.1:551.5

Jílek, Josef, **Vodíkové pumy a vyvoj počasí.** [Hydrogen bombs and weather development.] *Meteorologické Zprávy*, Prague, 9(5/6):148, **1956.** 3 refs. **DWB**—The author briefly discusses the possible weather effect of thermonuclear explosions and concludes that the energy released is too small for such an effect but the problem of dust particles carried aloft by an explosion remains to be clarified. (*Same item as* 8.11–116, Nov. 1957, *MAB.*) *Subject Heading:* **1. Thermonuclear explosion effects on weather.**—*G.T.*

9C–69 551.510.721:551.577.7(52)

Kamada, Masaakira and Onishi, Tomio, **Occurrence of an unusually high-level artificial radioactive rainfall in the area of Kagoshima, Japan, since May 14, 1954.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:161–175. 10 figs., 7 tables, 8 refs.) **DLC** (UF767.J32)—Method and results of rainfall radioactivity measurements at Kagoshima from April 1954 to March 1955 are reported. The highest amount measured was about 120×10^{-9} curie/l, at the beginning of a rainfall on May 16, 1954. There were indications of a change in the composition of airborne radioactive debris when captured by raindrops. The capturing efficiency of raindrops appeared to be better in respect of artificial radioactive particles than for natural nuclides. *Subject Headings:* **1. Radioactivity in rainwater 2. Bikini H-bomb tests, 1954 3. Kagoshima, Japan.**—*G.T.*

9C–70 551.510.721(81)

Kegel, Gunter (*Rio de Janeiro*), **Measurements of long-range fallout in Rio de Janeiro.** *Academia Brasileira de Ciencias, Anais*, 28(4):447–453, Dec. **1956.** 7 figs., 3 refs., 2 eqs. **DLC**—Data on atmospheric radioactivity measured in Rio de Janeiro from May to July 1956 (filter method) are presented. Fission-product radioactivity showed a considerable increase during the 3-month period but the highest value was less than 2×10^{-19} curie/cm^3 as opposed to 600×10^{-19} curie/cm^3 reported to have been measured in Washington, D. C. Fission radioactivity increases always coincided with the arrival of cold fronts and rainstorms. *Subject Headings:* **1. Radioactive fallout data 2. Radioactivity in the atmosphere 3. Rio de Janeiro, Brazil.**—*G.T.*

9C–71 623.454.8:551.510.721

Kellogg, W. W.; Rapp, R. R. and Greenfield, S. M., **Close-in fallout.** *Journal of Meteorology*, 14(1):1–8, Feb. **1957.** 7 figs., 5 refs. **DWB**—Distribution of radioactive material from a surface atomic explosion deposited on the ground within a few hundred miles in 10–20 hours is discussed. Parameters considered are wind structure, particle size and radioactivity, height and size of atomic cloud. Structure of atomic cloud at various stages of development is described. The fallout is computed at intervals from $\frac{1}{2}$ to 6 hrs for cases of high and low wind. Prediction is uncertain but computation after test explosions can reproduce observed fallout patterns within one standard deviation. (*Same item as* 8.6–176, June 1957, *MAB.*) *Subject Heading:* **1. Radioactive fallout.** —*C.E.P.B.*

9C–72 620.92:539.1:551.515

Khrgian, A. Kh., **Bol'shie vzryvy i atmosfernye iavleniia.** [Big explosions and atmospheric phenomena.] *Priroda*, Moscow, No. 3:31–37, March **1957.** 6 refs., 5 figs., table. **DLC**—The

energy released by an atom bomb is comparable to the energy of a small thunderstorm. H-bomb energy is far less than the energy of a cyclone. Only a small part of the explosive energy is transformed into atmospheric waves which can be detected at long distances. Information about the distribution of radioactive particles is unreliable and contradictory. A single volcanic eruption may be by far more powerful than a H-bomb explosion. The effect of explosions on weather is negligible. The discussion is entirely based on foreign sources; no Soviet data are disclosed. *Subject Headings:* **1. Atomic explosion effects on weather 2. Radioactive fallout.**—*A.A.*

9C–73 551.510.7:551.577.7(52)

Kiba, Toshiyasu; Ohashi, Shigeru; Wakamatsu, Minoru; Minabe, Tadaaki and Kishi, Ikuko, **Artificial radioactivity in rain and snow water observed at Kanazawa from May 1954 to April 1955.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:271–277. 5 figs., 3 tables, 2 refs.) **DLC** (UF767.J32)—A rainwater collector suitable for obtaining precipitation samples at different times during rain (radioactivity varies in the course of a rainfall) is described and illustrated. Amounts of radioactivity measured in rain and snow at Kanazawa from May 1954 to April 1954 are presented. Highest activities measured in rain were 11,888 cpm/l on Nov. 4, and 23,815 cpm/l on Nov. 9. Dates of explosions are derived. *Subject Headings:* **1. Radioactivity in precipitation 2. Bikini H-bomb tests, 1954 3. Kanazawa, Japan.**—*G.T.*

9C–74 551.510.7:551.577.7(52)

Kiba, Toshiyasu; Ohashi, Shigeru and Kishi, Ikuko, **Artificial radioactivity in snow as observed in Kanazawa, Jan. 1955.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:279–281. fig., 3 tables.) **DLC** (UF767.J32)—The results of measurements on the vertical distribution of radioactivity in various snow covers are reported. Counts of the evaporated snow residue were taken 6 hr. after sampling with a Geiger-Müller tube provided with an end window of mica and a scalar. Only slight radioactivity was detected at the beginning of observations but increased, especially in the bottom layers, as snow depth decreased. The increased radioactivity is attributable to the settling of soot or dust particles at the bottom of snow and water run-off and evaporation. The relatively higher activity measured in the top layers on Feb. 2 is believed to have been caused by fallout during this period. Data are tabulated on the radioactivity of individual 5-cm snow layers, snow types, and the increase in radioactivity following the decrease in snow depth. *Subject Headings:* **1. Radioactivity in snow cover 2. Bikini H-bomb tests, 1954 3. Kanazawa, Japan.**—*SIPRE abstract.*

9C–75 551.510.7:551.577.7(52)

Kimura, Kenjiro; Yokoyama, Yuji; Sano, Hirotoshi; Mabuchi, Hisao and Komatsu, Kazuhiro, **On the artificial radioactivity of rainfall in Japan.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, Research in the effects and influences of the nuclear bomb test explosions. Tokyo, **1956.** Vol. 1:263–269. 6 figs., 4 tables.) **DLC** (UF767.J32)—Results of measurements of radioactivity in rain and snow at the University of Tokyo are presented. During the period of observation (April–July 1954 and Jan.–March 1955) values up to 3300 cpm/l were observed in May 1954, and 230 cpm/l in March 1955. Results of radiochemical analysis are included. *Subject Headings:* **1. Radioactivity in rainwater 2. Radioactivity in snow 3. Tokyo, Japan.**—*G.T.*

9C–76 551.510.721

Kimura, Kenjiro, **Radiochemical studies on the radioactive dust due to the nuclear detonation at the Bikini Atoll on March 1, 1954.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:491–495. table, 7 refs.) **DLC** (UF767.J32)—This article introduces Pt. III (Sec. on Chemistry) of the Report. It states that radioactive dust originating in a nuclear explosion on Bikini Atoll in March 1954 was analyzed for radiochemical properties at five chemical laboratories in Japan. A list of over thirty nuclides identified is presented. Detailed reports on results of the analyses constitute the rest of the Section (p. 497–613). (These reports are not being abstracted separately but are listed by author and title in Pt. III, p. 375 of this issue of *MAB.*) *Subject Headings:* **1. Radioactive fallout analysis 2. Bikini H-bomb tests, 1954.**—*G.T.*

9C–77 551.510.7:551.578.11

King, P.; Lockhart, L. B., Jr.; Baus, R. A. et al., **RaD, RaE, and Po in the atmosphere.** *Nucleonics,* N. Y., 14(6):78, 80–84, June **1956.** 4 tables. **DLC**—Rainwater and air filter collections made in 1950 at Wash., D. C., and at several U. S. Navy bases in various parts of the world show

that RaD activity varies widely (by a factor of 10) between island sites (e.g., Samoa) and inland locations (Wash., D. C.), and also at different times at same place, though not as widely as between places. Data on Bi and Pb fractions (α and β activity) in air and rainwater at Wash., D. C., and 6 other places, and on RaE (Bi^{210}) at Wash., D. C., are presented in detail. Methods of collection and chemical analysis are described in full. (*Same item as* 8.8–103, August 1957, *MAB.*) *Subject Headings:* **1. Radioactivity of rainwater 2. Radioactivity in the atmosphere 3. Washington, D. C. I. Patterson, R. L., Jr. II. Friedman, H. III. Blifford, I. H., Jr.**—*M.R.*

9C–78 551.577.7:551.510.7(52)

Kitagaki, T., **Radioactivity in rain water in Sendai District.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:349–355. 4 figs., 5 tables.) **DLC** (UF767.J32)—The results of investigations from May 1954–Feb. 1955 on the radioactivity of rain and snow and its relation to meteorological conditions are discussed. The intensity of the radioactivity of snow collected from Dec.–Feb. was found to be generally higher than that of rain, due to the higher collecting efficiency of snow as indicated by its capture of natural activity (Rn series and others). The collecting efficiency of snow was found to be higher than that of rain by a factor of 10. Data are tabulated and graphed on the radioactivity of rain and snow, accompanying meteorological conditions, short-period decay of natural radioactivity of rain and snow, and the exponential decrease of radioactivity density in rain. *Subject Headings:* **1. Radioactivity in rainwater 2. Bikini H-bomb tests, 1954 3. Sendai, Japan.**—*SIPRE abstract* 15924.

9C–79 551.510.721

Kitagaki, T. and Onuki, Y., **Some physical properties of radioactivity fallen on Japan.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:477–489. 13 figs., 2 tables, 9 refs., 9 eqs.) **DLC** (UF767.J32)—Discusses methods of determining dates of atomic explosions by means of the decay of radioactivity in fallout or contaminated objects, or by means of absorption curves. *Subject Headings:* **1. Atomic explosion dating 2. Bikini H-bomb tests, 1954.**—*G.T.*

9C–80 551.510.721:551.577.7(52)

Kitahara, Keita; Nishio, Kazuo; Hayashi, Shigeyuki; Araki, Mikio and Muraoka, Yukie, **Artificial radioactivity in rainwater and dust as observed at Kagoshima City, Kyushu, Japan, from May 1954 to March 1955.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb.** Tokyo, **1956.** Vol. 1:181–191. 5 figs., 4 tables, 5 refs.) **DLC**—At Kagoshima the artificial radioactivity of every rainfall was measured from May 18, 1954 and the radioactivity of airborne dust every other day from Nov. 4, 1954 to March 31, 1955. During this period of observations new fission products were detected in the atmosphere over Kagoshima in Sept. and Nov. 1954, but the radioactivity of rain water was not very remarkable in Sept. Even the highest intensities observed were not as high as those due to the atomic explosions at the Bikini Atoll. In 1955 there was a peak in the radioactivity of airborne dust and rain, probably due to a series of tests in the U. S. *Subject Headings:* **1. Radioactive fallout data 2. Bikini H-bomb tests, 1954 3. Kagoshima City, Japan.**—*From author's abstract.*

9C–81 551.510.721:551.577.7(52)

Koyama, Seitaro and Sotobayashi, Takeshi, **Radioactive components in the rainwater as observed in Niigata, Japan in Sept. and Nov. 1954.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb.** Tokyo, **1956.** Vol. 1:315–348. 37 figs., 6 tables, 12 refs.) **DLC**—On Sept. 18, 24 and Nov. 4–9, 1954 large quantities of radioactive rainout were observed at Niigata, Japan. Components were analyzed by the conventional group separation and partially with ion exchange technique. Each fraction was studied by the radiochemical method, viz. analysis of decay curves and aluminum absorption curves. Ba-140 and Sr-89 were perfectly isolated by using resin, and were determined. Presence of Te-I-132, Mo-99, U-237, Np-239, I-131, La-140, Ce-Pr-144, Zr-Nb-95, Ru-Rh-106 was ascertained by the values of half-life and β-emission energy. Ce-141, Pr-143 or Nd-147, Ru-103, Ag-111, Cd-115m, Sn-125 were only found by analysis of decay curves. The presence of Np-239 and U-237 implies the participation of U-238 or natural uranium, but their percentages were not as large as in the case of ashes or rainout of Bikini tests in the spring of 1954. The characteristic of the Soviet nuclear detonation which was deduced from the analytical data of Nov. 4 rainout is, roughly speaking, similar to that of a simple Pu-bomb furnished with U-238 not as an "uranium jacket," but merely as a "tamper." One of the nuclear detonations of Sept. is supposed to be the fission of U-235. The dates of explosions were calculated, namely Sept. 15,

Sept. 19–20 and Oct. 28–29. Their decay exponents were from −1.4 to −1.6. *Subject Headings:* **1. Radioactive fallout composition 2. Radioactivity in rainwater 3. Bikini H-bomb tests, 1954 4. Niigata, Japan 4. U.S.S.R.**—*Authors' summary.*

9C–82 551.510.7:623.454.8

†Kulp, J. Laurence; Giletti, Bruno J. and Broecker, Wallace S., **Radioactive isotopes in the atmosphere.** Columbia Univ. Lamont Geological Observatory, Contract AF 19(604)-851, Final Report, July 15, **1956.** 41 p. numerous figs and tables, 83 refs., 20 eqs., appends.—This report constitutes a summary of all the research carried out under this contract. The contents are as follows: history and objective of the project which initially was the development of a technique for measuring small concentrations of radioactive isotopes introduced into the atmosphere by atomic explosions, especially C^{14} and H^3; tritium distribution in natural water; natural and bomb produced variations of tritium in rainfall; survey of published methods for counting low level activities of C^{14} and tritium; carbon monoxide in the earth's atmosphere; carbon^{14} scintillation counting; H_2 extraction from air; the natural tritium content of atmospheric hydrogen; atmospheric sampling of CO_2 for C^{14} assay; low level C^{14} counting system using CO_2; quantitative preparations of H_2 from H_2O; radiometric assay of H^3 by proportional counting of hydrogen-methane mixtures; electrolytic enrichment procedure; H/D analysis in modified consolidated 401 mass spectrometer; and catalogue of natural water samples collected in connection with this work. (*Same item as* 8.8–104, Aug. 1957, *MAB.*) *Subject Headings:* **1. Radioactivity in the atmosphere 2. Atomic explosions 3. Radiocarbon concentration 4. Tritium measurement.**—*I.L.D.*

9C–83 551.510.721

Kulp, J. Laurence; Eckelmann, Walter R. and Schulert, Arthur R., **Strontium-90 in man,** [Pt. 1]. *Science,* Washington, D. C., 125(3241):219–225, Feb. 8, **1957.** 3 figs., 2 tables, refs. Also: **Pt. 2** by Eckelmann, Walter R.; Kulp, J. L. and Schulert, A. R. *Ibid.,* 127(3293):266–274, Feb. 7, **1958.** 2 figs., 10 tables, refs. Also: **Comments** [on Pt. 1] by Ralph E. Lapp, with reply by Kulp et al., *Ibid.,* 125:933–934, May 10, **1957.** Reprinted in Congressional Subcommittee Report (9C–166), p. 694–705. **DLC**—Data on Sr^{90} amounts in human bones are presented. The study is based on over 1000 analyses of autopsy samples received from 30 stations distributed over the globe. The data presented include Sr^{90} concentration as a function of age, geographical distribution of Sr^{90} in bones, Sr^{90} content in various materials, comparison of amounts in human bones and total fallout, etc. Assuming continuation of nuclear testing at the rate of 1956–1957, an equilibrium bone level of 21 $\mu\mu$C of Sr^{90} per g of calcium is predicted for the population of the N.E. United States. *Subject Headings:* **1. Strontium^{90} in human bones 2. Strontium^{90} global distribution.**—*G.T.*

9C–84 551.510.721(52)

Laberrigue-Frolow, J. and Yuasa, T., **Rapport sur les analyses faites au Japon, des cendres radioactives projetées lors de l'explosion de Bikini du 1er mars 1954.** [Report on analyses made in Japan of the radioactive fallout from the Bikini explosion, March 1, 1954.] *La Semaine des Hopitaux,* Vol. 32, *Pathologie et Biologie,* No. 7: P. et B. 446–450 (i.e., *Annales de la Recherche Médicale,* No. 3:R.M. 142–146), April **1956.** 3 figs., 2 tables. (Also in: **L'Énergie atomique dans ses répercussions sur la vie et la santé.** [Atomic energy in its repercussions on life and health.] ed. by F. Biquard. pub. Paris, L'Expansion, **1956.** p. 31–42.) **DNLM**—Results reported by two Japanese study groups on the effects of the Bikini tests on the Japanese fishing boat "Fukuriu Maru" are reviewed (for one of the original reports, *see* 7E–111, May 1956, *MAB*). Tables and graphs are reproduced. Harmful elements like Sr^{90} and Ca^{44} were found in larger than maximum permissible amounts. *Subject Headings:* **1. Radioactive fallout analysis 2. Strontium^{90} 3. Bikini H-bomb tests, 1954 4. Japan.**—*G.T.*

9C–85 551.577.7

Lal, D.; Narasappaya, N. and Zutshi, P. K., **Phosphorus isotopes p^{32} and p^{33} in rain water.** *Nuclear Physics,* Amsterdam, 3(1):69–75, March **1957.** 2 figs., 2 tables, 16 refs. **DLC**—Approximate concentrations (atoms ml^{-1} of rain water) of the isotopes p^{32} and p^{33} have been obtained; both are present in comparable amounts. The observed concentrations agree in order of magnitude with those reported by Marquez and Costa for p^{32}. They agree also with a rough estimate based on the number of disintegrations produced in the atmosphere by cosmic radiation and the estimated cross section for this reaction. A simultaneous determination of the concentrations in rain water of these chemically identical radioactive nucleides, may prove valuable in meteorological studies. It may be useful for tracing the large scale motion of air masses. *Subject Headings:* **1. Radioactivity in rainwater 2. Radioactive tracer techniques.**—*From authors' abstract.*

9C–86 551.510.721

Lapp, Ralph E., **The "humanitarian" H-bomb.** *Bulletin of the Atomic Scientists,* Chicago, 12(7):261–264, Sept. **1956.** Also his: **Strontium limits in peace and war.** *Ibid.,* 12(8):287–289,

320, Oct. **1956.** foot-refs. **DLC**—In "The humanitarian H-bomb," the fifth in a series of articles (for the 1st to 4th articles, *see* 7E–204, May 1956, *MAB*), the author discusses the mechanism of the production of radioactive isotopes from fission-fusion-fission bombs and the fallacy of statements concerning "clean" bombs. In "Strontium limits . . ." (6th in the series) the stratospheric hold-up of Sr^{90}, the findings of Project Sunshine, the Twentieth Semiannual Report of the Atomic Energy Commission (July 21, 1956), the possible role of the United Nations in controlling nuclear tests, and the military viewpoint are discussed. Assuming uniform global fallout (and total commitment of Sr to the stratosphere), it is estimated that 665 twenty-megaton bombs would produce five times the maximum permissible concentration of Sr^{90}. The author also finds that the strontium hazard calculations on p. 106 of the AEC's 20th Semiannual Report are inaccurate and should be corrected by a factor of 40. *Subject Headings:* **1. Radioactive fallout control 2. Atomic explosion effects.** —*G.T.*

9C–87 551.510.721

Leĭpunskiĭ, O. I., **Radioaktivnaia opasnost' vzryvov chistovodorodoĭ bomby i obychnoĭ atomnoĭ bomby.** [Radioactive hazards from pure hydrogen bombs and ordinary atomic bombs.] *Atomnaia Energiia*, Moscow, 3(12):530–539, Dec. **1957.** 6 tables, 12 refs., 9 eqs. **DLC**—The amount of radioactive products from hydrogen bombs (deuterium-tritium fusion bombs) and fission bombs are compared. The biologically active elements (C^{14} and H^3 for fusion, Sr^{90}, Cs^{137} and C^{14} for fission bombs) are evaluated in terms of amount of biological damage (tissues, bones, mutations and leukemia) per 10 megatons of TNT equivalent. It is concluded that as far as total radiation hazard to the world population is concerned, fusion bombs are not less of a menace than fission bombs. *Subject Headings:* **1. Thermonuclear explosion effects 2. Strontium^{90} global distribution.**—*G.T.*

9C–88 551.510.721

Libby, Willard F., **Radioactive fall-out.** *Bulletin of the Atomic Scientists*, 11(7):256–260, Sept. **1955. DLC**—The author considers radioactive fallout hazards from nuclear test explosions in terms of 10 megaton weapons and concludes "that the natural radioactivities of the body, the effects of the cosmic radiation, and the natural radiation of the radioactivities of the earth's surface constitute hazards which are much greater than the test fall-out hazards." In the case of full-scale atomic war, however, fallout could be expected to increase by large factors and reach dangerous levels (genetic effects, general health effects, bone cancer due to Sr^{90}, etc.). *Subject Headings:* **1. Radioactive fallout hazards 2. Strontium^{90} in human bones.**—*G.T.*

9C–89 551.510.721

Libby, Willard F. (*U. S. Atomic Energy Commission*), **Radioactive fallout. National Safety News,** Chicago, 72(5):60, 62, 98–99, Nov. **1955. DLC**—The distribution of various types of fallout contamination in space and time (including contamination of food by Sr^{90}) is discussed with particular attention to possible protective and decontamination measures. *Subject Headings:* **1. Radioactive fallout 2. Civilian defense.**—*G.T.*

9C–90 551.510.721:546.42:577

Libby, W. F. (*U. S. Atomic Energy Commission*), **Radioactive fallout and radioactive strontium.** *Science*, Wash., D. C., 123(3199):657–660, April 20, **1956.** Reprinted in Congressional Subcommittee Report (9C–91), p. 1462–1467. **DLC**—Sr^{90} is biologically one of the most significant radioisotopes produced in nuclear explosions, as it has a half-life of 28 years and will stay in the human body (bones) for a long time. The author thoroughly explains the mechanisms whereby this isotope is produced, distributed over the globe, brought back to the earth's surface and taken in by soil, plants, animals, food products and human beings. Critical amounts and biological effects are discussed. The author concludes that "worldwide health hazards from the present rate of testing are insignificant." Fallout within a few hundred miles of nuclear surface explosions constitutes a serious hazard, but adequate precautions are being taken. (*Same item as* 7.9–262, Sept. 1956, *MAB.*) *Subject Headings:* **1. Radioactive fallout 2. Biological effects of radioactivity.**—*G.T.*

9C–91 551.510.721

*Libby, Willard F., **Radioactive strontium fallout.** *National Academy of Sciences, Wash., D. C., Proceedings*, 42(6):365–390, June **1956.** 10 figs., 13 tables, 29 refs., 5 eqs. Also his: **Current research findings on radioactive fallout.** *Ibid.*, 42(12):945–962, Dec. **1956.** 7 figs., 3 tables, 7 refs. Reprinted in Congressional Subcommittee Report (9C–166), p. 1468–1511. **DLC**—Hazards from Sr^{90} deposited in fallout following nuclear explosions are reviewed. Sr^{90} is of particular interest among the fission products because of chemical similarity to Ca, an average life of about 40 years, and a low rate of skeletal elimination. The maximum permissible average concentration of Sr^{90} in the adult skeleton is calculated to be 1 μc/1000 gm of Ca. Data is summarized on Ca, Sr, and Sr^{90} concentration in samples of soil, animal, and plant material collected throughout the world before and after

the thermonuclear explosions during Operation Castle. A Sr^{90} fallout probably derived from megaton weapons and nearly uniform over the world except for local effects due to rainfall variations and to fallout from submegaton weapons, was found to occur at least 1.7 years after the megaton test series. The average world-wide Sr^{90} fallout rate in the fall of 1954 and the spring and summer of 1955 was 1.2 mc/mi²/yr. An estimate is presented of fallout rate of Sr^{90} to be expected from weapons tests up to and including the Castle series. Factors influencing the transfer of Sr^{90} from soil to plants, to animals and milk produced by them and, finally, to the human skeleton are discussed. The second paper contains more data obtained under Project Sunshine from a large variety of material collected on a world-wide basis. Amounts of fallout expected from weapons fired to date, effect of rainfall on fallout deposition, and direct measurement of stratospheric fallout content are among the problems discussed. *Subject Headings:* **1. Radioactive fallout analysis 2. Thermonuclear explosion effects 3. Strontium^{90} fallout.**—*U. S. AEC abstract and G.T.*

9C–92 551.510.721

Libby, Willard F. (*U. S. Atomic Energy Commission*), **Fallout from the A-bomb.** *Ordnance*, Wash., D. C., 41(217):40–43, July/Aug. **1956. DLC**—The radioactivity produced in megaton weapons is placed largely and immediately in the stratosphere while the smaller kiloton weapons produce clouds which do not reach into the stratosphere, and the bulk of their radioactivity is left in the troposphere. In the troposphere where rain occurs, any particulate matter will be washed down in a period of days or weeks. It is easy to show that one-tenth inch of ordinary rainfall will probably remove almost completely all particulate matter except that which is so small as to be nearly of molecular dimensions. *Subject Heading:* **1. Radioactive fallout propagation.**—*Author's abstract.*

9C–93 551.510.721

Libby, Willard F., **Fallout risk evaluated.** *Chemical and Engineering News*, Wash., D. C., 35(19):38, May 13, **1957. DLC**—Sr^{90} now in the stratosphere will fall out at a rate about equal to the decay of material already deposited. Thus no additional increase in Sr^{90} is expected from weapons fired in the past. At the present rate of weapons testing 4 to 15 "sunshine units" will accumulate in human bones during the next 50 years, the tolerance set for the general public being 100 sunshine units (microcuries per gram of body calcium). *Subject Headings:* **1. Radioactive fallout data 2. Strontium^{90} in human bones 3. Strontium^{90} global distribution.**—*G.T.*

9C–94 551.510.721

Libby, Willard F., **Radioactive fallout.** *National Academy of Sciences, Wash., D. C., Proceedings*, 43(8):758–775, Aug. **1957.** 7 figs., 2 tables, 4 refs. **DLC**—Radioactive fallout mechanisms, dissemination of Sr^{90} fallout, its biological effects, maximum permissible level, geographic distribution, etc., are discussed. Data are presented on radioactivity levels in human bones from Sr^{90} (Chicago) and other (natural) radioactive substances; Sr^{90} activity measured in soil samples throughout the U. S., and in rain at New York (1954–1956) and Pittsburgh (1955–1956). The author concludes that an equilibrium Sr^{90} concentration of 5–20 Sunshine Units would be reached in a few decades at the present rate of weapons testing. In limited areas the tolerance level of 100 units might be reached but fetilization with calcium might be used to minimize harmful effects. *Subject Headings:* **1. Radioactive fallout data 2. Strontium^{90} global distribution.**—*G.T.*

9C–95 551.510.721

*List, Robert J. (*U. S. W. B., Wash., D. C.*), **Radioactive fallout in North America from Operation Teapot.** *U. S. Atomic Energy Commission, [Report] NYO-4606* (Del.), Feb. **1956.** 128 p. 19 figs., 4 tables, 92 figs. in appendix. (For *abstract on* pre-publication issue, *see* 7E–210, May 1956, *MAB*) —Operation Teapot, in the spring of 1955, consisted of 14 atomic detonations at the Nevada Test Site. Meteorological trajectories were computed for the resulting radioactive debris and related to the fallout observed by the gummed film network of 87 stations in the continental U. S., twelve stations in Canada, and six stations elsewhere in North America. Maps showing daily fallout data for the period Feb. 18–May 20, 1955 are appended. A series of special gummed film observations near Chicago indicated that on dry days with significant fallout, film exposed in vertical and inverted positions averaged about 40% of the activity on a regular horizontal film. On days with precipitation, the values were 4% on vertical films and 1% on the inverted films. A radioautograph of individual raindrops during a period when rainout was occurring indicated about three drops in a hundred were radioactive. The radioactive drops contained both particulate and dissolved radioactivity. (*Same item as* 8.6-26, June 1957, *MAB.*) *Subject Headings:* **1. Radioactive fallout data 2. United States.**—*Author's abstract.*

9C–96 551.510.721

Lockhart, L. B., Jr.; Baus, R. A. and Blifford, I. H., Jr., **Atmospheric radioactivity along the 80th meridian, 1956.** *U. S. Naval Research Laboratory, NRL Report*, No. 4965, July 23, **1957.**

13 p. 2 tables, 11 figs., 11 refs. **DWB**—Measurements of atmospheric radioactivity and fallout at a number of sites along the 80th meridian (west) are reported for the year 1956. These results were obtained through the combined efforts of the U. S. Naval Research Laboratory and the Meteorological Services of Chile, Peru, and Ecuador with the cooperation of the U. S. Weather Bureau and the U. S. Atomic Energy Commission. Radioactivity levels at the various sites during 1956 are reported for three different collecting systems: air filters, cloth screens, and gummed films. Extremely wide variations in the gross radioactivity of fission products in the air have been noted, with the highest levels occurring in the Northern Hemisphere. The presence of some of the peaks of activity at various localities has been correlated with known atomic explosions. Radiochemical techniques are being developed for the routine analysis of collections for certain isotopes. Preliminary results of such analyses of a few filter collections indicate that the air at all of the collecting sites contains a greater proportion of the longer-lived fission products than would be expected in a young fission-product conglomerate. (*For earlier report see* 9C–9.) *Subject Headings:* **1. Radioactive fallout data 2. Radioactive fallout composition.**—*Authors' abstract.*

9C–97 551.510.721

Lockhart, L. B., Jr.; Baus, R. A. and Blifford, I. H., Jr., **Fission product radioactivity in the air along the 80th meridian, January–June 1957.** *U. S. Naval Research Laboratory, NRL Report,* No. 5041, Nov. 27, 1957. 9 p. 4 figs., 2 tables, 4 refs. **DWB**—The concentration of long-lived radioactive products (primarily fission products) in the air continues to remain considerably higher in the Northern than in the Southern Hemisphere. Nowhere has it approached the maximum permissible level for continuous exposure to external radiation established by the U. S. Atomic Energy Commission. Among the more interesting developments, there has been obtained a definite inverse relation between the air concentration of radioactivity and rainfall during the dry and rainy seasons at Panama. The use of "radioactivity profiles" (plots of latitude vs fission product concentration) to represent a cross section of the average air concentrations of fission products along the 80th meridian for any given period offers a ready means to obtain the total burden of such activity in the atmosphere for such a period and to follow its increase or decrease with time. *Subject Headings:* **1. Radioactive fallout data 2. Radioactivity profiles.**—*Authors' abstract.*

9C–98 551.508.9:551.510.7

Lugeon, Jean, **Monitoring the radioactive content of the atmosphere.** *World Meteorological Organization, WMO Bulletin,* 6(3):110–111, July 1957. 3 figs. **DWB**—Two pieces of equipment for monitoring atmospheric radioactivity—a detector unit and a measuring unit—are described and illustrated. Variations in radioactive pollution in two periods (April 1955 and Nov.–Dec. 1955) are shown graphically. The equipment manufactured by Landis and Gyr in Zug, Switzerland, is installed at the Payerne Aerological Station, and similar equipment will be set up at Murchison Bay (80°N) by the Swiss IGY expedition. *Subject Headings:* **1. Radioactive monitoring equipment 2. Swiss participation in IGY 3. Payerne, Switzerland 4. Murchison Bay, Spitzbergen.**—*M.R.*

9C–99 551.510.7:551.511:551.551

Machta, Lester, **Vertical diffusion in the stratosphere.** (In: American Meteorological Society. District of Columbia Branch, **Proceedings of the Workshop on Stratospheric Analysis and Forecasting, Feb. 1–3, 1956.** pub. 1956. p. 78–83. 12 refs.) **DWB**—Three basic methods of investigating stratospheric diffusion are briefly reviewed: 1) the use of first principles (determination of vertical mixing from temperature gradients, wind speed and wind shear), 2) gaseous tracers (such as ozone, water vapor, tritium, argon and beryllium-7) and 3) man-made probes (parachutes, balloons, aircraft, smoke puffs). The author concludes "that while the meteorologist has generally accepted the stratosphere as a region of little mixing and turbulence, the evidence on the subject is not entirely convincing." *Subject Headings:* **1. Stratospheric diffusion 2. Radioactive tracer techniques.**—*G.T.*

9C–100 551.510.721:623.454.8:551.557.2

Machta, L.; List, R. J. and Hubert, L. F. (*all, U. S. W. B., Wash., D. C.*), **World-wide travel of atomic debris.** *Science,* Wash., D. C., 124(3220):474–477, Sept. 14, 1956. 5 figs., 4 refs. Reprinted in Congressional Subcommittee Report (9C–166), p. 162–170. **DLC**—Upper winds (to 120,000 ft) measured during the 2 nuclear explosions "Mike" on Nov. 1, 1952 and "Bravo" on March 1, 1954 are shown for every 5000 ft level above the sea, and discussed in relation to general circulation in the mid-Pacific. Estimated paths for several days after each spot are shown on global charts, with figures plotted thereon to indicate number of days between detonation and observation of fission products at ground. Total radioactive fallout for 2–35 days after detonation is also shown on a chart for each test. Some debris was collected in Southern Hemisphere in each case, before any was reported from U. S., although amounts were very low (possibly due to washing out by rain in tropics before reaching Southern Hemisphere stations). Conclusion is that radioactive debris

is not so good as a tracer because it must reach the ground (usually by rain) before it is detected by present networks. It has possibilities however. (*Same item as* 8.8–106, Aug. 1957, *MAB.*) *Subject Headings:* **1. Radioactive fallout 2. Global fallout patterns.**—*M.R.*

9C–101 551.510.72:623.454.8:551.557.2

Machta, L.; Hamilton, H. L., Jr.; Hubert, L. F.; List, R. J. and Nagler, K. M., **Airborne measurements of atomic debris.** *Journal of Meteorology*, 14(2):165–175, April **1957.** 50 figs., 2 tables, 2 refs. **DWB**—Relative measurements were made in flights along 80th and 95th meridians after 5 tests of atomic devices in Nevada (Jan. 27–Feb. 6, 1951). Numerous radioactivity profiles are shown. Air trajectories at levels 10,000–40,000 ft were drawn from meteorological data for each burst and errors where trajectory crosses flight line are tabulated. Coefficient of lateral diffusion was $1.6–4.8 \times 10^8$ cm²/sec. Flights were also made over Gulf of Mexico on Feb. 8 and 9. (*Same item as* 8.7–105, Aug. 1957, *MAB.*) *Subject Headings:* **1. Atomic explosion products 2. Upper air wind trajectories.**—*C.E.P.B.*

9C–102 551.510.721

Machta, Lester (*U. S. W. B., Wash., D. C.*), **Meteorological factors affecting spread of radioactivity from nuclear bombs.** *Washington Academy of Sciences, Journal*, 47(6):169–179, June **1957.** 7 figs. **DLC**—Mechanisms involved in the propagation and deposition of local, intermediate and delayed fallout are reviewed with particular attention to the problem of stratospheric storage of Sr^{90} and its rate of deposition. LIBBY's approach to the determination of the rate of removal from the stratosphere is found to be the best available, but it is shown that such determination is complicated by different factors which are not fully understood at present. Stratospheric sampling is recommended as a means of studying the distribution of radioactive particles in space and time, which would lead to "a more rational interpretation of storage time." *Subject Headings:* **1. Radioactive fallout propagation 2. Strontium^{90} stratospheric storage.**—*G.T.*

9C–103 551.515:551.510.7(213)

Malurkar, S. L. (*Colaba Obs., Bombay*), **Radioactive isotopes for study of tropical meteorology and oceanography.** *Journal of Scientific and Industrial Research, Sec. A*, New Delhi, 15(6):272–274, June **1956.** 8 refs. **DWB, DLC**—The problem of interhemispheric exchange of air or water masses during the monsoon periods and when hurricanes or typhoons occur in the Pacific, Indian (or N. Atlantic) could be solved if radioactive isotopes were released over a broad area during the appropriate seasons at specified points, and mapping of resulting concentrations was performed 7 to 20 days later (for monsoons) or 3 to 4 days later over a small region in the case of tropical cyclones or monsoon depressions in India. For ocean currents the time lapse before mapping would have to be 2–3 times greater. *Subject Headings:* **1. Radioactive tracers for tropical meteorology 2. Interhemispheric exchange tracing.**—*M.R.*

9C–104 551.511.6:551.510.721

†Marciano, J. J., **A theoretical study of atmospheric diffusion with applications to fallout from atomic clouds.** *U. S. Navy Electronic Laboratory, San Diego, Calif. Research Report*, 663, Feb. **17, 1956.** 28 p. fig., 32 refs., 76 eqs.—Methods and equations are developed for determining time of arrival, cumulative dose, total dose and fallout area for gaseous and solid debris diffusing from sources resembling atomic clouds in shape. One of the solutions is an improvement over previous approaches along the same line, another solution presented is believed to be new, while a third is based on an improved equation whose value in this application has been overlooked before. Although the solutions appear mathematically formidable, they are readily subject to graphic presentation and application. (*Same item as* 8.8–107, Aug. 1957, *MAB.*) *Subject Headings:* **1. Radioactive fallout 2. Atmospheric diffusion.**—*Author's abstract.*

9C–105 551.510.721

Martell, E. A., **Strontium-90 concentration for biological materials, soils, waters and air filters.** U. S. Atomic Energy Commision, AECU-3297 (Rev.), Aug. 1, **1956,** Rev. Jan. 1, **1957.** 67 p. 5 figs., 6 tables, 5 refs. Originally issued by Chicago Univ. Enrico Fermi Institute for Nuclear Studies as its *Project Sunshine Bulletin*, No. 12, Aug. 1, 1956, under Contract At(11-1)-281. Also published in Congressional Subcommittee Report (9C–166), p. 617–650. **DLC**—Extensive Sr^{90} concentration data obtained in laboratory analyses of samples of various materials are presented. The samples were collected from 1953 to 1956 at various locations throughout the world (including the Southern Hemisphere) and were analyzed at the Univ. of Chicago. They represent the following elements and materials: surface air concentration at Washington, D. C., Kodiak, Alaska, Port Lyautey, French Morocco and Yokosuka, Japan; Chicago rain, soil, alfalfa and milk; human bone (U. S. and foreign countries, divided by age group); animal bone, animal products, milk, plants and soil. *Subject Headings:* **1. Sr^{90} global distribution 2. Sr^{90} in human bones 3. Radioactive fallout data 4. Project Sunshine.**—*G.T.*

9C–106 551.5:620.92:539.1

Meade, P. J., **Atomic energy and the meteorologist.** *Meteorological Magazine*, London, 86(1024):289–296, Oct. **1957.** 7 refs. **DWB**—The problem is to what extent natural radiation can be increased without serious risk. Explosion of atomic bombs is followed by close-in fall-out within 20 hrs and long range fall-out of particles airborne for days, months or years. Weapon tests must be sited, so that dangerous close-in fall-out does not fall on inhabited areas. Long range fall-out is a question of measurement (up to 48,000 ft). Atomic bombs affect the troposphere, hydrogen bombs the stratosphere. Siting of reactors depends on estimates of diffusion in the atmosphere. Radioactive substances can be used as tracers for air trajectories, but with care. Finally, international collaboration through WMO and IGY and with other sciences is discussed. *Subject Heading:* **1. Atomic energy meteorology.**—*C.E.P.B.*

9C–107 551.510.721(52)

Meteorological Society of Japan, Committee of the Investigation on Artificial Radioactivity, **The thermo-nuclear experiment and its after effects on the atmosphere and the ocean.** *Meteorological Society of Japan, Tokyo, Journal, Ser.* 2, 34(2):115–123, May **1956.** 4 figs., 9 tables, 20 refs. Also in *American Meteorological Society, Bulletin*, 38(8):453–459, Oct. **1957. DWB, DLC**—Many papers on the effects of artificial radioactivity on the atmosphere and the ocean have been presented since 1954 tests of A- and H-bombs. Our researches revealed that the atmospheric contamination of artificial radioactivity was spread all over this country and its coastal areas. This short note contains a brief review of the researches carried out in Japan, specialists in respective fields contributing each section of it, under the direction of K. Itoo, Chairman of the Committee. *Subject Headings:* **1. Radioactive fallout research 2. Bikini H-bomb tests, 1954 3. Japan. I. Itoo, K.**—*Author's abstract.*

9C–108 551.510.721(52)

Miyake, Y.; Sugiura, Y. and Katsuragi, Y. (*Met. Res. Inst., Tokyo*), **Radioactive fallout at Asahikawa, Hokkaido in April 1955.** *Meteorological Society of Japan, Tokyo, Journal, Ser.* 2, 34(4):226–230, Aug. **1956.** 6 figs., 7 tables, 5 refs. **DWB, DLC**—A remarkable artificial radioactivity was found in a fallout collected at Asahikawa on April 12, 1955. Its specific activity was determined to be 2660 cpm/g on April 22, which is equivalent to about 22.5 mμ c/g. The quantity of fallout amounted to about 1.9 g/m². Chemical analysis showed the sample was loess from North China, while the radioactivity is ascribed to a Nevada test. This is explained by a trajectory from Nevada which passes over China. *Subject Headings:* **1. Radioactive fallout analysis 2. Radioactive fallout trajectories 3. Asahikawa, Japan.**—*Authors' abstract (ed. by List).*

9C–109 662.2:539.1:551.510.72

Miyake, Yasuo, **Effects of atomic explosions on the atmosphere and the sun.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:1–6. table.) **DLC** (UF767.J32)—The phenomena observed in connection with nuclear test explosions on Bikini Atoll in the spring of 1954, and reported in this paper are: 1) microbarographic oscillations at Shionomisaki, 2) tidal oscillation at several Japanese tidal gage stations, 3) vertical distribution of radioactivity over Tokyo and Tateno up to 6000 m measured from balloons and airplane, 4) artificial radioactivity in rainwater and 5) distribution of radioactivity in the sea. The organization of routine radioactivity observations in Japan is described. *Subject Headings:* **1. Atomic explosion effects on weather 2. Bikini H-bomb tests, 1954 3. Radioactive fallout 4. Japan.**—*G.T.*

9C–110 551.510.721:551.577.7(52)

Miyake, Yasuo, **Artificial radioactivity in rainwater observed in Japan.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:151–159. 3 figs., 10 refs.) **DLC** (UF767.J32)—The method of rainwater radioactivity measurement adopted in Japan is described and results obtained by 20 institutes throughout Japan are discussed along with those found elsewhere (U. S., France). Increases of radioactivity observed in Japan at various times are traced back to nuclear tests in the Pacific, in Nevada and possibly in the U.S.S.R. It is concluded that effects of radioactive fallout due to atomic explosions are on a global scale. *Subject Headings:* **1. Radioactivity in rainwater 2. Thermonuclear explosion effects 3. Bikini H-bomb tests, 1954.**—*G.T.*

9C–111 551.463/4:551.510.721(265)

Miyake, Y.; Sugiura, Y. and Kameda, K., **On the artificial radioactivity in the sea near Japan.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol.

1:415–417. fig., 2 tables.) Also in: *Papers in Meteorology and Geophysics*, Tokyo, 6(1):90–92, May **1955.** Review in: *Science*, 125(3249):654, April 5, **1957. DLC**—Sea water radioactivity in the Pacific Ocean south of Japan was measured from July to Sept. 1954. Some seventy points of sampling, and nine of these where radioactivity was found, are shown in a chart. No explanation is found for the fact that the radioactive area was located between Torishima Island and the Japanese mainland. *Subject Headings:* **1. Radioactivity in ocean water 2. Pacific Ocean.**—*G.T.*

9C–112 551.510.721(52)

Miyake, Y.; Saruhashi, K. and Kogoshi, K., **Radiochemical analysis of fission products contained in the soil collected at Tokyo, May 1954.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:729–730.) Also in: *Papers in Meteorology and Geophysics*, Tokyo, 6(1):93–94, May **1955. DLC**—As a result of the semi-quantitative analysis of radionuclides in the soil some appreciable radioactivities in the fractions of rare earth elements and alkali earth elements were found. Rough estimations of radionuclides contained in 1 g of soil are as follows: rare earth, 9.10^{-13} C/g; Sr^{89}, 3.10^{-13} and $Ba,^{140}$, 7.10^{-13}. Radiochemical sampling of rain water may be replaced by soil sampling, using 100∼1000 g of soil, when direct analysis of rain water is difficult. The measurements must be preceded by separation of rare earth elements, barium, strontium, etc. *Subject Headings:* **1. Radioactive fallout analysis 2. Radioactivity in soil 3. Tokyo, Japan.**—*Authors' abstract.*

9C–113 551.510.7(52)

Miyazaki, Yukio and Kondo, Ichiro, **Studies on the radioactivity in the atmosphere.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb.** Tokyo, **1956.** Vol. 1:141–147. 4 figs., 2 tables, ref., eqs.) **DLC**—Continuous measurements were made of the radioactivity in the atmosphere by means of a Neher-type ionization chamber and a counter tray. The effect of cosmic rays was taken into account, and the following results were obtained: 1) The intensity increase was proportional to the amount of rainfall, but the peak of the increase was 2–3 hours later than that of rain; 2) The radioactivity contained in raindrops was about 7.6μc/l, where the velocity of rainfall and the attenuation mean free path of γ-rays were assumed to be 5 m/sec and 100 m, respectively; 3) The diurnal variation of the intensity on non-rainy days showed an amplitude range of 1% with the maximum at 15 h. The diurnal variation of the intensity was large when the temperature variation on the ground was large. *Subject Headings:* **1. Radioactivity in the atmosphere 2. Japan.** —*Authors' summary.*

9C–114 539.16(02)

†*Murin, Andreĭ Nikolaevich, **Vvedenie v radioaktivnost'.** [Introduction to radioactivity.] Leningrad, Izdat. Leningradskogo Univ., **1955.** 250 p. 110 figs., tables, refs., eqs. **DLC** (QC975.M8)—In this textbook on natural and artificial radioactivity for students specializing in chemistry, geology, biology and geochemistry, Ch. III (p. 30–57) deals with natural radioactivity from various elements in the rocks and Ch. IV (p. 57–71) with various methods of measuring radioactivity. The next 3 chapters take up α, β and γ particles, respectively, in considerable detail. *Subject Headings:* **1. Radioactivity measurement techniques 2. Radioactivity textbooks.**—*M.R.*

9C–115 551.510.7(52)

Nagasawa, R., **Sudden increase and exponential decrease of background measured in Kagoshima with a G.M. tube.** (In: Japan. Committee for Compilation of Report on Research in the effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:149–150. 7 refs.) **DLC** (UF767.J32)—The author has been measuring background radioactivity at Kagoshima since Dec. 1953 by means of a G-M tube. On May 9, 1954 he observed a 50% increase in activity, which is attributed to nuclear explosions in the Pacific in May. Since that event (up to Sept. 15) measured values have remained 2 or 3 points above those obtained before May 9. The possibility of an accumulation of contaminated material in the atmosphere is tentatively suggested. *Subject Headings:* **1. Radioactivity in the atmosphere 2. Bikini H-bomb tests, 1954 3. Kagoshima, Japan.**—*G.T.*

9C–116 662.2:539.1:525.69

Nakano, Masito, **Atomic energy and the oscillation of sea level.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions,** Tokyo, **1956.** Vol. 1:401–407, 4 figs., 6 refs.) **DLC** (UF767.J32)—Anomalous oscillations in tidal gage records on the Pacific coast of Japan are reported. They were observed at the two tidal stations, Hanasaki (May 5, 1954) and Kushimoto (March 27, April 26 and May 5). The records showing the anomalies are presented. No anomalous oscillations

occurred at other Pacific tidal stations in Japan, and it cannot be ascertained whether those at Hanasaki and Kushimoto were due to nuclear tests in the Pacific. *Subject Headings:* **1. Thermonuclear explosion effects on sea level 2. Bikini H-bomb tests, 1954 3. Japan.**—*G.T.*

9C–117 551.510.721:551.577.7(52)

Nishiwaki, Yasushi et al., **Artificial radioactivity in the rain in Osaka, Japan during the period from April 1954 to April 1955.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:211–222. 9 figs., table, 7 refs.) **DLC** (UF767.J32)—This report covers the period April 1954–April 1955. It follows the same general pattern as the other reports published in this volume on radioactivity measurement in different Japanese cities: 1) description of method of measurement (in Osaka dust was collected both by evaporation of rain water and directly on greased paper), 2) presentation of the values measured, 3) absorption curves and 4) decay curves of selected samples, and 5) discussion of relationships with nuclear tests. *Subject Headings:* **1. Radioactivity in rainwater 2. Bikini H-bomb tests, 1954 3. Osaka, Japan.** —*G.T.*

9C–118 551.510.721:551.577.7(52)

Oana, S. and Nakai, N., **Radioactivity of fission products in the rain water collected on the Higashiyama Campus of Nagoya University, Nagoya, Japan.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:237–244. fig., 2 tables.) **DLC** (UF767.J32)—Values of radioactivity measured in rainwater at Nagoya, Japan, from May to Nov. 1954 are presented (highest value measured was 4555 cpm/l on May 16). Decay curves identify the observed radioactivity as being due to fission products. *Subject Headings:* **1. Radioactivity in rainwater 2. Bikini H-bomb tests, 1954 3. Nagoya, Japan.**—*G.T.*

9C–119 551.510.7:551.577.7(52)

Okada, Shigetoshi, **On the radioactivity in rain and snow in the District of Sapporo.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:393–399. tables.) **DLC** (UF767.J32)—Radioactivity amounts obtained in precipitation in Sapporo, Japan from July 1954 to Feb. 1955 are tabulated. No excessive values of radioactivity are found. *Subject Headings:* **1. Radioactivity in rainwater 2. Radioactivity in snow 3. Bikini H-bomb tests, 1954 4. Sapporo, Japan.**—*G.T.*

9C–120 551.510.721

Ophel, I. L., **Fallout and the Strontium-90 hazard.** *Science*, Wash., D. C., 125(3244):399, March **1, 1957. DLC**—In a paper on radioactive fallout (*see* 7E–124, May 1956, *MAB*), H. L. ANDREWS (*Natl. Cancer Inst.*) estimated that (assuming uniform distribution of all Sr^{90} from a nominal atom bomb over an area of 2 sq mi) a person would have to consume the fission produce deposited on 4 sq ft of food, or drink 50,000 cu ft of water (based on Lake Mead) in order to reach the maximum permissible radiation level. This calculation is in error by a factor of 200, OPHEL points out, as ANDREWS assumed the permissible radiation to be 1.0 microgram instead of 1.0 microcurie as established in NBS Handbook 52. The correct figures would be 3 sq in of food and 250 cu ft of water. *Subject Headings:* **1. Radioactive fallout analysis 2. Strontium^{90} local fallout. I. Andrews, H. L.**—*G.T.*

9C–121 551.510.721:551.511

Orcel, J., **Les nuages radio-actifs; leur déplacement dans l'atmosphère comparé aux mouvements des nuages de cendres dans les explosions volcaniques, et aux vents de sable et de poussières des regions désertiques.** [Radioactive clouds; their displacement in the atmosphere compared with the movements of ash clouds in volcanic explosions and with sand and dust storms of the desert regions.] *La Semaine des Hopitaux*, Vol. 32, *Pathologie et Biologie*, No. 7: P. et B. 457–460 (i.e., *Annales de la Recherche Médicale*, No. 3:R.M. 153–156.) April **1956.** foot-refs. (Also in: **L'Energie atomique dans ses répercussions sur la vie et la santé.** [Atomic energy in its repercussions on life and health.] ed. by F. Biquard. pub. Paris, L'Expansion, **1956.** p. 61–70.) **DNLM**—The total energies involved in a volcanic eruption of the first order and in a thermonuclear explosion are comparable. The height to which the ashes are projected (of the order of 15 km) and their transport over considerable distances from the site of eruption (often greater than 1500 km), and a comparison with the movements of sand and dust storms in desert regions serve as clues to the propagation of radioactive dust in connection with the thermonuclear explosion experiments at Bikini in March 1954. *Subject Headings:* **1. Radioactive fallout propagation 2. Bikini H-bomb tests, 1954.**—*Trans. of author's abstract.*

9C–122 551.510.72:551.556

Otsuka, R. and Shimada, K., **On the upper currents in low latitudes of the Northwestern Pacific Ocean at the beginning of March 1954.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:7–26. 14 figs.) Also their: **On the vertical structure of upper winds in low latitudes during the period from March to May 1954.** *Ibid.*, p. 27–32. 5 figs., 3 refs. Also their: **On the upper currents in the Far East and Siberia during Sept. to Nov. 1954.** *Ibid.*, p. 33–85. 26 figs., 10 refs. **DLC**—In the first two papers streamline charts for various levels over the central Pacific and time cross sections of upper air winds for 9 Pacific stations are presented for March 1954. Both wind speed and direction are found to vary considerably with height and horizontally, making it difficult to predict the size of the area likely to be affected by a nuclear explosion. The third paper contains synoptic surface and upper air charts and data on precipitation distribution and winds in and around Japan and Siberia from Sept. to Nov. 1954 when strong radioactivity was measured throughout Japan. The study shows that radioactive contamination may be carried by upper-air currents to considerable distances. *Subject Headings:* **1. Radioactivity in the atmosphere 2. Wind effects on radioactivity 3. Bikini H-bomb tests, 1954 4. Japan 5. Siberia.**—*G.T.*

9C–123 551.508.9:551.577.7

Pašić, H., **Mjerenje radioaktivnosti padavina.** [Measurement of radioactivity in precipitation.] *Yugoslavia. Hidrometeorološka Služba, Vesnik*, 5(1/2):15–17, Jan./June **1956.** 4 figs. **DWB**—Two methods of measuring radioactivity in rain water are described: an evaporation method and a filtration method. Diagrams of the gages adapted to such measurement are presented. *Subject Headings:* **1. Radioactivity in rainwater 2. Radioactivity measurement.**—*G.T.*

9C–124 551.594.11:623.454.8

Pierce, E. T., **Nuclear explosions and a possible secular variation of the potential gradient in the atmosphere.** *Journal of Atmospheric and Terrestrial Physics*, 11(1):70–72, **1957.** table, ref., 6 eqs. **DWB**—Fair-weather potential gradient results from thunderstorms and certain ionizing radiations. Radioactive fall-out after nuclear explosions is producing a semipermanent contamination of earth's surface. Mean annual values of potential gradient at 1 m on undisturbed days 1946–1956 compared with average 1928–1937 show a pronounced secular decrease at Eskdalemuir but not at Lerwick. (*Same item as* 8.11–264, Nov. 1957, *MAB.*) *Subject Headings:* **1. Potential gradient variations 2. Atomic explosion effects.**—*C.E.P.B.*

9C–125 551.510.721

Pirie, A. (*ed.*), **Fall out: radiation hazards from nuclear explosions.** Foreword by Bertrand Russell. (Contributions by) J. H. Humphrey, E. Burhop et al. London, MacGibbon & Kee, **1957.** 160 p. figs., tables, 13 refs. **DLC** (UF767.P5)—Radiation hazards due to radioactive fallout are discussed by a pool of scientists, each specializing in studies on a particular aspect of the field. The subjects discussed include the influence of ionizing radiation on cancer and leukemia, cancer of the bone and Sr^{90}, absorption of radioactive substances in the body, genetic effects, and accumulation of radioactivity in plants and animals. Atmospheric propagation of atomic debris is discussed on p. 41–46. The authors' opinion that nuclear tests should be discontinued is sustained by some vigorous arguments. *Subject Headings:* **1. Radioactive fallout hazards. I. Russell, Bertrand.**—*G.T.*

9C–126 662.2:539.1:546.26:551.510.41

Rafter, T. A. and Fergusson, G. U., **"Atom bomb effect"—recent increase of carbon-14 content of the atmosphere and biosphere.** *Science*, Wash., D. C., 126(3273):557–558, Sept. 20, **1957.** 8 refs. **DLC**—Results of atmospheric CO_2 sampling in New Zealand beginning on Nov. 24, 1954 for the purpose of studying natural C^{14} variations are presented in condensed form. There is evidence of an increase in C^{14} content in 9 samples obtained since June 3, 1955, and from Dec. 12, 1956 to March 23, 1957. Specific increase since Feb. 1955 is reported to be $4.10 \pm 0.5\%$. A check by means of simple exposure of trays of barium hydroxide for 7–10 days shows a C^{14} increase of $4.90 \pm 0.60\%$ from May 1955–May 1957. Young leaves of trees previously tested showed a $4.25 \pm 0.5\%$ Increase from 1953–57. Surface ocean water obtained in a rocky seacoast shows an increase of $2.0 \pm 0.5\%$ from 1954–57. Effects of Northern Hemisphere weapons testing and return to normal if testing ceased, are considered. The "industrial effect" has been subtracted. *Subject Headings:* **1. Atomic explosion effects on radiocarbon 2. Radiocarbon variations 3. New Zealand.**—*M.R.*

9C–127 662.2:539.1:551.5

†Rakipova, L. R., **Vliianie atomnykh vzryvov na atmosferu.** [Influence of atomic explosions on the atmosphere.] *Meteorologiia i Gidrologiia*, Leningrad, No. 6:53–57, June **1957.** 26 refs. **DWB**—A review of Soviet, German, American and English studies on the effect of atomic explosions

upon meteorological processes, atmospheric radioactivity, etc. Energies of atomic explosions and of atmospheric processes, namely solar radiation, are compared. Effect of explosions upon microbaric atmospheric waves, and tidal waves, the amount and nature of dust injected into the atmosphere (comparison with Krakatoa explosion), the occurrence of Bishop rings, effect of atomic explosion upon atmospheric radioactivity, etc., are discussed. *Subject Headings:* **1. Atomic explosion effects on weather.**—*I.L.D.*

9C–128 551.510.721:551.501.9

Rand Corporation, Santa Monica, Calif., **Worldwide effects of atomic weapons: Project Sunshine.** Contract At(11-1)-135, Contract AF 33(038)-6413, [Report] R-251-AEC, Aug. 6, **1953**; Amended **1956.** 96 p. figs., tables, refs., eqs. **DLC** (AS36.R3)—Project Sunshine is an extensive program of sampling and analysis aimed primarily at determining present and expected amounts of world-wide radiation levels due to Sr^{90} in the atmosphere, in human bones and in other materials. This report reflects the 1953 status of the Project. It contains a clear exposition of the facts and considerations on which the Project is based and of the methods used and proposed. Origin and nature of radioactive debris, its distribution and the meteorological factors affecting it, absorption of Sr^{90} in the human body, maximum permissible body burden, methods of sampling and analysis, and calculation of particle size distribution and settling, and of radiological hazards are among the problems treated. Useful tables of physical and biological constants involved in fallout hazard calculations are appended. *Subject Headings:* **1. Strontium^{90} global distribution 2. Radioactive fallout calculation manuals 3. Project Sunshine.**—*G.T.*

9C–129 551.510.71

Reiter, Reinhold, **Schwankungen der natürlichen Luftradioaktivität im Talniveau der nördlichen Kalkalpen.** [Variations of natural radioactivity of the air in valleys of the northern Chalcolithic Alps.] *Meteorologische Rundschau*, 10(2):44–45, March/April **1957.** fig., 5 refs. **DWB**—On rainless days in April–Nov. 1956, 420 measurements were made at Farchant, 5 km N of Garmisch in Loisach valley. Plotted against mean air flow over the Alps, points show a clear concentration between W. and S.E., and also extreme variations. Results are of interest for convection processes, health, etc. (*Same item as* 8.9–317, Sept. 1957, *MAB.*) *Subject Headings:* **1. Radioactivity in the atmosphere 2. Bavarian Alps.**—*C.E.P.B.*

9C–130 551.508.9:551.510.721

Rosinski, Jan, **Some studies on the evaluation of gummed-paper collectors used in determining radioactive fallout.** *American Geophysical Union, Transactions*, 38(6):857–863, Dec. **1957.** 9 figs., 3 tables, 8 refs. **DWB, DLC**—Part of the study on the evaluation of the gummed-paper collector used in determining radioactive fallout is presented. Sampling under rainless conditions was examined quantitatively as a function of humidity, wind velocity, ultraviolet radiation, and storage time. It was found that sampling is a complicated function of wind velocity and humidity, with electrostatic effects as a dependent variable. Sampling during rain was found to be a function of the wettability of particulate matter, hydrophobic particles being readily deposited from raindrops. Some evidence is presented that the delayed radioactive fallout is hydrophilic or soluble in water or both. *Subject Heading:* **1. Radioactivity measurement techniques.**—*Author's abstract.*

9C–131 662.2:539.1:551.5

Roulleau, J., **Influences éventuelles des explosions atomiques sur l'évolution du temps.** [Possible influences of atomic explosions on weather development.] *La Semaine des Hopitaux*, Vol. 32, *Pathologie et Biologie*, No. 7: P. et B, 452–454 (i.e., *Annales de la Recherche Médicale*, No. 3:R.M. 148–150), April **1956.** (Also in: **L'Énergie atomique dans ses répercussions sur la vie et la santé.** [Atomic energy in its repersussions on life and health.] ed. by F. Biquard. pub. Paris, L'Expansion, **1956.** p. 48–55.) **DNLM**—The author examines, in turn, the different possible effects of atomic explosions on the behavior of the atmosphere; the influence of chemical compounds produced; the role of dust as condensation nuclei, and as a screen partially absorbing radiation; the energy effects of the reaction. If noticeable changes do not appear to occur in cloudiness, precipitation regime and the temperature, one can visualize, in certain particular exceptional cases, the appearance or the premature triggering of perturbations. This possibility can be proven only by statistics extending over a great number of years. *Subject Headings:* **1. Thermonuclear explosion effects on weather.**—*Trans. of author's abstract.*

9C–132 551.46:546.79 551.510.42:551.578.8:551.510.7:623.454.8

Royal Astronomical Society, **Geophysical discussion [on the use of natural and artificial tracer elements in geophysical research].** *Observatory*, 77(897):62–66, April **1957.**—At meeting held Feb. 1, 1957 under chairmanship of P. A. Sheppard, H. C. Urey discussed ratio of O^{18} to O^{14} in $CaCO_3$ in oceanic deposits as a measure of paleotemperatures, showing variations and decreasing

temperature. He then considered concentrations of deuterium and hydrogen in hot springs. L. H. N. Cooper said that a knowledge of circulation of the oceans could be aided by suitable tracers. He showed diagrams and current mechanisms along slopes and in submarine canyons. N. G. Stewart discussed radiological hazard to world population due to nuclear explosions, the most important being 28-year Sr^{90}. Several other speakers took part. *Subject Headings:* **1. Tracer elements 2. Radioactive fallout 3. Oceanic composition 4. Oceanic circulation. I. Urey, H. C. II. Cooper, L. H. N. III. Stewart, N. G.**—*C.E.P.B.*

9C–133 551.513.7:623.454.8

Růžička, Karel, **Vztah výbuchů vodíkových pum k hydrometeorologickým anomalitám?** [Is there a relation between hydrogen bomb explosions and hydrometeorological anomalies?] *Meteorologické Zprávy*, Prague, 9(5/6):148–152, **1956. DWB**—Statements of a number of scientists and organizations in the U. S., England, France, Germany, Japan, etc. are quoted. These statements refer to the biological menace of atmospheric radioactivity produced by thermonuclear explosions. The author believes that such radioactivity may also disturb the atmospheric circulation by modifying the charges of atmospheric electricity. In support of this hypothesis he lists close to 200 weather anomalies which occurred throughout the world in 1955 and the beginning of 1956, possibly as a consequence of thermonuclear explosions. *Subject Headings:* **1. Thermonuclear explosion effects 2. Atmospheric circulation anomalies.**—*G.T.*

9C–134 551.510.721:551.577.7(52)

Sapporo, Japan. Hokkaido Univ. Nakaya Laboratory, **On the artificial radioactivity of snow and rain in Sapporo.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:387–392.) **DLC** (UF767.J32)—Data on radioactivity in rain and snow measured at Sapporo from April 1954 to March 1955 are presented. No such large activity or spectacular increase of activity was found here as that observed in Honshu or Kyushu islands. Out of 35 samples only 8 had specific activity exceeding 100 cpm/l and none of these reached 1000 cpm/l. *Subject Headings:* **1. Radioactivity in precipitation 2. Bikini H-bomb tests, 1954 3. Sapporo, Japan.**—*G.T.*

9C–135 551.510.721

Schuert, E. A., **A fallout plotting device.** *U. S. Naval Radiological Defense Laboratory, San Francisco, Calif., Research and Development Technical Report USNRDL-TR-127*, Nov. 30, **1956.** 14 p. 7 figs. Reprinted in Congressional Subcommittee Report (9C–166), p. 267–280. **DWB** (539.752 S385f)—A plotter for predicting fallout patterns in terms of "particle size" and "height" lines (showing where and from what altitude certain sizes of fallout particles will arrive) is described. No drafting equipment is needed for the use of this device; it consists of a base for direction or azimuth orientation and a wheel for distance or displacement. Both parts are made of transparent plastic and can be placed directly over a map. Diagrams of the plotter base and the wheels for various particle sizes are presented and plotting instructions are included. It was found that untrained personnel can use the device effectively. *Subject Heading:* **1. Radioactive fallout computation.**—*G.T.*

9C–136 551.510.721:551.508.9

Schumann, G., **Künstliche radioaktive Produkte in der Atmosphäre.** [Artificial radioactivity in the atmosphere.] *Zeitschrift für angewandte Physik*, Berlin, 8(8):361–364, Aug. **1956.** 4 figs., 12 refs. **DLC**—The filter method of measuring radioactivity in the atmosphere is described in some detail; results of measurement made at Konigstuhl (565 m elev) near Heidelberg, Germany from March 1953 through May 1955 (in Micro-Micro-curies/m^3) using cylindrical β counters with sensitivity of 10^{-14} cu/m^3 are shown on time graph; the method of beta determining time of explosion is described and illustrated graphically; maximum values are about 4–6$\mu\mu$ curies, well within the range of natural radioactivity, though showing up as sharp peaks against low background activity at the observation point. (*Same item as* 8.5–124, May 1957, *MAB.*) *Subject Headings:* **1. Radioactivity measurement techniques 4. Königstuhl, Germany.**—*M.R.*

9C–137 551.510.7

Schumann, G., **Atmosphärische Radioaktivität.** [Atmospheric radioactivity.] (In: Israel, H., ed., **Luftelektrizität im A.G.I.: Bericht über die Tagung in Aachen am 11.-12. Mai 1956.** pub. Aachen, **1957.** p. 45–53. 4 figs., 11 refs., eqs. German and English summaries, p. 45–46.) **DWB**—The classical ionization-chamber method mainly measures radon. Recently the filter method was developed which measures the daughter products of the emanations and all other non-gaseous active substances in the air. The ratio of the different activities on the filter depends not only on the concentrations in the filtered air but also on the exposition time. Absolute average values for

the concentrations are given according to measurements of several years. The non-gaseous active atoms are trapped by aerosols. Therefore the study of activities constitutes a tracer method for the behaviour of aerosols in the atmosphere. Especially the life-time of aerosols in different heights could be estimated from observing long-living activities. The influence of meteorological conditions is considerable. It can not be explained by correlations to single parameters but only by taking into account the collective effect of all weather components. *Subject Heading:* **1. Radioactivity in the atmosphere.**—*Author's abstract.*

9C–138 551.510.7:551.577.7(52)

Senoh, Hiroyuki, **The radioactivity in the rain water at Matsue City.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:205–209, table, 2 refs.) **DLC** (UF767.J32)—Rain water radioactivity counts obtained by the author with a G-M counter at Matsue from Sept. 1954 to April 1955 are tabulated. Radioactivity values are found to have increased during that period, which is attributed to a general contamination of the atmosphere. *Subject Headings:* **1. Radioactivity in rainwater 2. Bikini H-bomb tests, 1954 3. Matsue, Japan.** —*G.T.*

9C–139 551.510.721:551.577.7(52)

Shiokawa, Takanobu; Yagi, Masuo and Matsuoka, Yoshiyasu, **Radio chemical studies on rain water and radioactive-contaminated dusts that fell in Shizuoka District.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:245–253. 4 figs., 5 tables.) **DLC** (UF767.J32)—Data on radioactivity in rainfall and dust measured in Shizuoka district from May 1954 to March 1955 are tabulated and graphically presented. The highest activity measured was 1.95×10^4 cpm per 1 of rain water (May 20, 1954). An activity of 0.01μc/g was found in dust on a glass roof (April 27, 1955), mostly due to rare earths. *Subject Headings:* **1. Radioactive fallout data 2. Bikini H-bomb tests, 1954 3. Shizuoka, Japan.**—*G.T.*

9C–140 551.510.721(52)

Sidei, Tunahiko; Higashimura, Takenobu and Kami, Hisao, **Effect of artificial radioactive dusts on the atmospheric activity.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:121–124. 3 figs., 2 tables.) **DLC** (UF767.J32)—Radioactivity in dust collected by a filter-type air sampler was measured by means of a G-M counter. Counts obtained in Kyoto on 21 days between May 11 and Nov. 18, 1954 are tabulated. The gradual decrease from May to Aug. and the marked increase in the fall (1.7224 ± 0.0155 cpm/m^3 on Oct. 29) coincide with results obtained elsewhere in Japan by rainfall radioactivity measurement. *Subject Headings:* **1. Radioactivity in atmosphere 2. Radioactive fallout data 3. Bikini H-bomb tests, 1954. 4. Kyoto, Japan.**—*G.T.*

9C–141 551.510.721:551.577.7(52)

Sidei, Tunahiko; Higashimura, Takenobu; Kami, Hisao and Matunami, Tadao, **On the artificial radioactivity in rain water.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, Research in the effects and influences of the nuclear bomb test explosions. Tokyo, **1956.** Vol. 1:223–235. 5 figs., 4 tables, ft. ref.) **DLC** (UF767.J32)—At Kyoto University radioactivity in precipitation was measured from April 1954 to May 1955, using the method adopted throughout Japan (evaporation of rainwater collected on polyvinyl sheet and measurement by G-M counter after decay of natural radioactivity), and radionuclides were separated by radiochemical analysis. Measured activities are tabulated and decay curves presented. Relationships are found with air masses and with dates of nuclear tests. *Subject Headings:* **1. Radioactivity in rainwater 2. Bikini H-bomb tests, 1954 3. Japan.**—*G.T.*

9C–142 551.510.7 662.2:539.1

Sievert, Rolf M. (*Inst. of Radiophysics, Stockholm*), **Records of gamma radiation from the ground and beta radiation from radioactive debris in Sweden, 1950–1955, Pt. 1.** *Tellus*, Stockholm, 8(2):117–126, May **1956.** 14 figs., 4 tables, 30 refs. **DLC**—The γ radiation of the ground from natural and artificial radioactivity, and the β radiation from radioactive debris in the atmosphere, have been recorded in Sweden since 1950. On several occasions increased radioactivity has been observed, sometimes producing effects by far exceeding the variations of the normal level. Observations are reported on the influence of rain and snowfall, with and without the effects caused by transportation of radioactive debris from nuclear explosions. (*Same item as* 8.4–331, April 1957, *MAB.*) *Subject Headings:* **1. Radioactivity in the atmosphere 2. Atomic explosion effects 3. Radioactivity of soil 4. Sweden.**—*Author's abstract.*

9C–143 551.577.7:551.510.7

Sittkus, A., **Radioactivität im Niederschlag.** [Radioactivity in precipitation.] (In: Israel, H., ed., **Luftelektrizität im A.G.I.: Bericht über die Tagung in Aachen am 11.-12. Mai 1956.** pub. Aachen, **1957.** p. 54–60. 2 foot-refs., 8 refs. German and English summaries p. 54.) **DWB**—The author gives a short survey of his researches on the natural and the artificial radioactivity in rain water and refers to the employment of such measurements of the artificial radioactivity for atmospheric electrical and meteorological purposes—e.g., for the characterization of air masses and for the determination of large scale air motions. *Subject Headings:* **1. Radioactivity in precipitation 2. Radioactive tracer techniques.**—*Author's abstract.*

9C–144 551.510:622.2:539.1

Smirnov, N. S., **K voprosu o vliianii atomnogo vzryva na sostoianie atmosfery.** [Influence of an atomic explosion on the state of the atmosphere.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 10:1227–1231, **1956. DLC**—The author reviews briefly various American, Western European and Japanese studies dealing with the effect of atomic explosions upon the state of atmosphere. He then considers the possible changes in the radiation radioactive properties of the atmosphere that can be caused by the explosion of one atomic bomb, how the increase in radioactivity can influence the radiation balance of the earth, the effect of atomic explosions upon the dust, ion and aerosol content of the atmosphere and the meteorological effects of atomic explosions such as the occurrence of fogs, etc. (*Same item as* 8.8–112, Aug. 1957, *MAB.*) *Subject Heading:* **1. Atomic explosion effects on the atmosphere.**—*I.L.D.*

9C–145 551.510.7:551.577.7(52)

Sogabe, Kiyozumi, **Radioactivity of rain water in Kochi City.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, Research in the effects and influences of the nuclear bomb test explosions. Tokyo, **1956.** Vol. 1:193–204. 11 figs., 7 tables, 3 refs.) **DLC** (UF767.J32)—The following data are presented on radioactivity measured in rain at Kochi City (May 1954–April 1955): graph and table of the daily values, decay curves of selected samples, and aluminum absorption curves of other samples. *Subject Headings:* **1. Radioactivity in rainwater 2. Bikini H-bomb tests, 1954 3. Kochi, Japan.**—*G.T.*

9C–146 551.510.721:551.577.7(52)

Sotobayashi, Takeshi and Koyama, Seitaro, **On the contamination with radioactive rain in Niigata City due to nuclear detonations of northwestern origin.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the Effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:309–314. 2 figs., 7 tables.) **DLC** (UF767.J32)—Distribution of radioactivity on various surfaces exposed to radioactive rain (soils, leaves, stone, wood) was measured and found to be governed by exposure to rain and surface characteristics, but not by chemical or biological absorptive properties. Nuclear fission products settle on surfaces like fine dust and can be removed by mechanical means if the surface is smooth. *Subject Headings:* **1. Radioactive contamination 2. Bikini H-bomb tests, 1954. 3. Niigata, Japan.**—*G.T.*

9C–147 551.508.9:551.510.71

Starčuk, Zenon and Kutzendörfer, Jaroslav (*Czechoslovak Acad. of Science*), **Měření koncentrace přirozeného radioaktivního aerosolu filtrační metodou a metodou elektrostatické precipitace.** [Measurement of natural radioactive aerosol concentration by the methods of filtration and electrostatic precipitation.] *Jaderná Energie*, Prague, 3(4):97–103, April **1957.** 5 figs., 4 tables, 14 refs., 18 eqs. **Comments** by V. Lenger and **Reply** by Starčuk and Kutzendörfer, *Ibid.*, 3(10):306–307, Oct. **1957.** Also: Starčuk, Z. and Kutzendörfer, J., **Absorpce částic alfa ve filtračním papire a v membřanovych ultrafiltrech.** [Absorption of alpha particles in filter paper and in membrane superfilters.] *Ibid.*, 3(10):290–292, Oct. **1957.** fig., table, 3 refs., eqs. **DLC**—Comparison is made of the collection efficiencies of Whatman 4 filter paper, an electrostatic precipitator and a membrane superfilter in respect of natural radioactive aerosols. The comparison is based on differences of atmospheric radon content determined simultaneously with the membrane superfilter and filter paper, and with the membrane superfilter and electrostatic precipitator, respectively... Values of functions involved in the computation of radioactivity amounts are tabulated for different lengths of sampling time. A nomogram is presented for quick computation of atmospheric radon content. *Subject Heading:* **1. Radioactivity measurement techniques.**—*Trans. of authors' abstract.*

9C–148 551.510.7:551.508.9

Steinhauser, F., **Vorläufige Mitteilungen über Freiluft-Registrierungen mit dem Geiger-Zähler.** [Preliminary report on free air recordings with the Geiger counter.] *Akademie der Wissenschaften,*

Vienna. Math.-Naturwiss. Klasse, Anzeiger, No. 11:209–215, **1955.** 2 figs. abstracted from reprint. —In order to be prepared for the dangerous variations of radioactivity in the air now possible in view of repeated explosions of A bombs and the expansion of installations for the peaceful use of atomic energy, a new method of measuring these variations in the lowest air layer by direct recording with a Geiger counter has been developed. The method and apparatus developed in the Austrian "Zentralanstalt" for Meteorology and Geodynamics, and the first results of the recordings made in Aug. 1955, are presented and discussed. (*Same item as* 8.10–291, Oct. 1957, *MAB.*) *Subject Headings:* **1. Radioactivity in the atmosphere 2. Geiger counters.**—*A.M.P.*

9C–149 551.510.42:551.510.7:551.501.9

Stern, Arthur C. (*Cincinnati, Ohio*), **Results of three years of operation of the National air sampling network.** *Air Pollution Control Association, Pittsburgh, Pa., Journal*, 7(4):284–288, Feb. **1958.** 6 figs., 10 refs. **DWB, DLC**—Routine sampling and analysis methods of the National Air Sampling Network of the Public Health Service are described. Radioactivity measurement is mentioned briefly. Beta and alpha radioactivity of particles suspended in the atmosphere has been measured since 1953; data are being prepared for publication and are available now in raw form (sample table presented). *Subject Headings:* **1. Atmospheric pollution networks 2. Radioactive fallout networks.**—*G.T.*

9C–150 551.510.721(410)

*Stewart, N. G.; Crooks, R. N. and Fisher, E. M. R., **The radiological dose to persons in the U.K. due to debris from nuclear test explosions prior to January 1956.** *Harwell, England, Atomic Energy Research Establishment, A.E.R.E. HP/R* 2017, 1956. 22+ p. graphs, 3 tables, 14 refs. Reprint in Congressional Subcommittee Report (9C–166), p. 1689–1708. **DLC**—Data on the deposition of Sr^{90} in the United Kingdom are presented and discussed on the basis of radiochemical analysis of rainwater samples. Since the spring of 1954, Sr^{90} has been deposited on the U.K. at a rate of 2.3 mc/km²/year, and the concentration on the ground reached a value of 4.5 mc/km² on Jan. 1, 1956. Due to the hold-up in the stratosphere of dust from thermonuclear explosions, the ground concentration of Sr^{90} from weapons exploded before Jan. 1, 1956 is expected to increase gradually and to pass through a maximum value of 14 mc/km² in about 1968. Weapons exploded since Jan. 1, 1956 will add a further contribution. If the present rate of firing is continued, an equilibrium value of 200 mc/km² of Sr^{90} may be reached in approximately 100 years time. From measurements of the gross radioactive content of rain water it has been calculated that a typical inhabitant of the U.K. will receive a total dose of 1.7 mr of external radiation over a period of 50 years as a result of weapons exploded before Jan. 1, 1956. If the present rate of firing continues, the estimated equilibrium dose per individual per generation will be 27 mr. (For earlier report, *see* 7E–171, May 1956, *MAB.*) *Subject Headings:* **1. Radioactive fallout data 2. Strontium^{90} global distribution 3. Great Britain.**—*G.T.*

9C–151 551.508.9:551.577.7

Stierstadt, Klaus, **Die Messung der Radioaktivität atmosphärischer Niederschläge.** [Measurement of radioactivity in atmospheric precipitation.] *Kosmos*, Stuttgart, 53(7):343–347, July **1957.** 7 figs., refs. (Also in: Braunbek, W. et al., **Gefährliche Strahlen.** [Dangerous radiation.] Stuttgart, Kosmos, **1957.** p. 101–112.) **DLC**—Problems connected with atmospheric radioactivity are discussed, namely sampling of dust from rain water or directly from the atmosphere, measurement by means of G-M counters or scintillation counters and possible biological effects of radioactivity. It is believed that the amount of Sr^{90} in the atmosphere would reach the limit of permissible dosage if nuclear tests were continued at the present rate over a period of 10 to 30 years. *Subject Headings:* **1. Radioactivity in precipitation 2. Strontium^{90} global distribution.**—*G.T.*

9C–152 551.508.9:551.510.7(08)

Stremme, W. (*Frankfurt a.M.*), **Kolloquium des "Sonderausschusses Radioaktivität" über Messmethoden der Radioaktivität in Luft, Wasser, Niederschlägen, Boden und Bewuchs am 22. u. 23. Juli 1957 in Frankfurt am Main.** [Colloquium of the "Special Committee for Radioactivity" on methods of measurement of radioactivity in air, water, precipitation, soil and plant cover on July 22 and 23, 1957, in Frankfurt a.M.] *Atompraxis*, Karlsruhe, 3(10):412, Oct. **1957. DLC**—The purpose of this meeting was an exchange of practical ideas between the 36 institutes of the German Federal Republic and 10 stations of the German Weather Service now measuring atmospheric radioactivity (especially in rainwater). Over a dozen papers were presented and are listed in this note by author and title. The papers and discussions dealt with measurement techniques and their accuracy. Two working groups were formed, one on chemical separation and one on standard of calibration. *Subject Headings:* **1. Radioactivity measurement techniques 2. Radioactivity symposia.**—*G.T.*

9C–153 551.577.7:551.510.71

†Styra, B. I., **O prirode aktivnosti atmosfernykh osadkov.** [The nature of radioactivity in precipitation.] *Lietuvos TSR Mokslu Akademija. Geologijos ir Geografijos Institutas, Mokslinia Pranešimai*, Vol. 2, *Geofizika*, issued Vilna, **1955.** p. 5–54. 12 figs., 7 tables, 52 refs., 34 eqs. Lithuanian summary p. 52–54. Also his: **Apie krituliu aktyvizacijos procesa atmosferoje.** [Capturing of radioactivity by precipitation.] *Ibid.*, p. 55–62. fig., 13 refs. Russian trans. p. 59–62. Also his: **Nekotorye voprosy aktivirovaniia atmosfernykh osadkov.** [Radioactivation of atmospheric precipitation.] *Ibid.*, p. 63–72. table, 14 refs., 19 eqs. Lithuanian summary p. 71–72. Also his: **K teorii priobreteniia chastitsami osadkov radioaktivnosti v atmosfere.** [Theory of the capturing of atmospheric radioactivity by precipitation particles.] *Ibid.*, Vol. 3, *Geofizika, Hidrologija*, issued Vilna, **1956.** p. 31–42. 5 figs., 6 tables, 18 refs., eq. **DWB**—Natural radioactivity in rain was measured simultaneously at the ground and 100–300 m above the ground (Kaunas airport); simultaneous measurements were also made of radioactivity in rain and in cloud droplets. These measurements bring to a final settlement the controversial issue whether the radioactivity of raindrops is built up in the clouds or picked up during their fall through the atmosphere. It is made clear that the radioactivation of droplets takes place in the clouds. The correlation between radioactivity and electrical charge of droplets was also analyzed and a larger amount of radioactive atoms was found in droplets with negative charge than in those with positive charge. In addition to reporting these results, the author gives a thorough review of the entire field of natural radioactivity in precipitation and its measurement. *Subject Headings:* **1. Radioactivity in precipitation 2. Kaunas, Lithuanian S.S.R.**—*G.T.*

9C–154 551.510.71

Styra, B. I. (*Lithuanian Acad. of Science*), **Izuchenie radioaktivnosti atmosfery.** [Investigation of atmospheric radioactivity.] *Akademiia Nauk, SSSR, Vestnik*, 27(8):49–54, Aug. **1957.** 19 refs. **DLC**—Work done in various countries (including Lithuania) in the field of natural atmospheric radioactivity measurement is reviewed. The problems discussed in particular are methods of sampling radioactive substances; radioactivity due to cosmic radiation; mechanisms of production and decay of atmospheric radioactivity; variations of radioactivity as functions of meteorological and geographic factors; and possible applications to atmospheric dynamic studies. Observations of artificial radioactivity in Japan, France, Germany and U. S. are mentioned. *Subject Headings:* **1. Radioactivity in the atmosphere 2. Radioactivity measurement techniques 3. Lithuanian S.S.R.**—*G.T.*

9C–155 551.510.721(52)

Sugiura, Y. and Kanazawa, T. (*Met. Res. Inst., Tokyo*), **On the radioactive fallout collected in Tokyo on Nov. 26, 1955.** *Papers in Meteorology and Geophysics*, Tokyo, 7(2):128–135, July **1956.** 8 figs., table, 2 refs. **DWB**—Following a nuclear test in the U.S.S.R. on Nov. 22, 1955, an activity of 47 mμC (20,500 Cpm) per m²/day was found in dust collected in Tokyo on Nov. 26 ,which was the highest value measured there since Sept. 1954. Results of the radiochemical analysis are discussed. Various radioisotopes, such as Te-131, Te-132, other anions, Nb, La-140, Ce-143, other rare earths, alkaline earths, U-237 and Np were identified. *Subject Headings:* **1. Radioactive fallout data 2. Radioactive fallout analysis 3. Tokyo, Japan.**—*G.T.*

9C–156 551.510.721:551.577.7(52)

Suzuki, Shigemitsu, **Artificial radioactivity in rain water precipitated in Hirosaki during the period from May 1954 to April 1955.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:375–385. 12 figs., 2 tables, 3 refs.) **DLC** (UF767.J32)—According to the results of routine observation of rainwater radioactivity at Hirosaki the residual affects of the Bikini experiment held in May 1954 were gradually decreasing up to the middle of Sept. 1954; from about Sept. 20 strong effects originating in another experiment, which took place probably in the northern part of the earth, replaced them. After Dec. 1954 these effects also decreased until the middle of Feb. 1955 when another effect, probably due to the experiments in Nevada was observed, and rather high values of radioactivity continued from March to April. The residual activity of lower parts of long-accumulated snow and also the contamination of soil close to the snow are under investigation. Samples obtained on April 25, 1955 contained 42 cpm/l in snow at the earth's surface, 2.8–cpm/g in soil at the surface, and 1.8 cpm/g in soil 5 cm below the surface. *Subject Headings:* **1. Radioactivity in precipitation 2. Bikini H-bomb tests, 1954 4. Hirosaki, Japan.**—*Author's summary.*

9C–157 551.510.721:551.577.7(439.1)

Szalay, Sándor and Berényi, Dénes, **Szokatlan rádioaktivitás megfigyelése a Debrecenben 1952. ápr. 22–dec. 31 között leesett csapadékokban.** [Unusual radioactivity observed in precipitation in

Debrecen between April 22 and Dec. 31, 1952.] *Magyar Tudományos Akadémia, Budapest. Matematikai és Fizikai Tudományok Osztálya, Közleményei*, 5(2):89–101, **1955.** Trans. into English in *Acta Physica*, Budapest, 5(1):1–14, **1955.** 6 figs., 16 refs. Russian summary p. 14. **DLC**—The authors investigated, by means of an end window β-counter tube Geiger-Müller equipment, the activity of precipitation which fell in Debrecen between April 22 and Dec. 31, 1952. At times the precipitation showed radioactivity which proved to be due to fission products deriving from atomic explosions. These anomalous activities, with a lag of a few days, were in correlation with dates of atomic explosions announced for this period. The order of magnitude of the activity calculated for a precipitation area of 1/50 sq. m was 10^{-11} Curie. *Subject Headings:* **1. Radioactivity in precipitation 2. Debrecen, Hungary.**—*From authors' abstract.*

9C–158 551.510.721(265)

Tajima, Eizo, **Statistical investigation of contaminated fishing boats.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:449–455. 6 figs.) **DLC** (UF767.J32)—Over 400 tuna fishing boats which entered Japanese ports from March to Aug. 1954, after having been in or near the hazard zone of nuclear tests in the Pacific, were examined for radioactive contamination. Relationships between contamination level and areas of operation (or passage) are analyzed. Results of the study are presented in graphs and a map. In general boats are found to have been contaminated by sea water west of the danger zone and by atmospheric fallout east of the danger zone. *Subject Headings:* **1. Radioactive contamination 2. Bikini H-bomb tests, 1954 3. Pacific Ocean.**—*G.T.*

9C–159 551.510.71:551.577.7

Tanaevsky, Olga and Vassy, Étienne, **Mesure de la radioactivité de l'air et de la pluie.** [Measurement of radioactivity of the air and of rain.] *La Semaine des Hopitaux*, Vol. 32, *Pathologie et Biologie*, No. 7: P. et B. 455–456 (i.e., *Annales de la Recherche Médicale*, No. 3:R.M. 151–152), April **1956.** 3 figs., table. (Also in: **L'Énergie atomique dans ses répercussions sur la vie et la santé.** [Atomic energy in its repercussions on life and health.] ed. by F. Biquard. pub. Paris, L'Expansion, **1956.** p. 56–60.) **DNLM**—Results of continuous atmospheric radioactivity measurements made at Val Joyeux Scientific Station (Dec. 1953–Aug. 1954) are reported. The radioactivity in the air is found to be due entirely to radon and thoron emanation. A definite negative correlation is found between such activity and wind speed (graph presented); no temperature or pressure effect could be detected. The radioactivity in precipitation appears to be of both natural and artificial origin. The strongest activity measured was 724 μC/l of rain. *Subject Headings:* **1. Radioactive emanation distribution 2. Radon content of atmosphere 3. Val Joyeux, France.**—*G.T.*

9C–160 551.510.7:551.577.7

Teichert, F., **Die natürliche Radioaktivität des Regenwassers in Dresden-Wahnsdorf, 1955/56.** [The natural radioactivity of rainwater in Dresden (Wahnsdorf) 1955/56.] *Zeitschrift fur Meteorologie*, 11(1):14–19, Jan. **1957.** 7 figs., 6 refs. **DLC**—Rainfall collected within 10 min was treated with barium chloride solution and dilute sulfuric acid and filtrate inserted in an ionization chamber. Ion-pairs/sec were counted with an electrometer. Average was 101.7×10^4 pairs or 34.8×10^{-11} curies per liter, ranging from 69.7×10^4 during steady rain to 163.7×10^4 after a dry interval >24 hrs. It was greater in showers than in upglide rain or snow. (*Same item as* 8.9–318, Sept. 1957, *MAB.*) *Subject Headings:* **1. Radioactivity of rainwater 2. Dresden, Germany.**—*C.E.P.B.*

9C–161 551.510.721:551.577.7(52)

Terasaki, T.; Yamanobe, Y.; Niizeki, H. and Kato, T., **On the artificial radioactivity of rainfall in Yamata, Pt. 1 and 2.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:357–374. 22 figs., 13 refs.) **DLC** (UF767.J32)—Data on radioactivity in precipitation measured in Yamagata from April to Nov. 1954 are presented. Rain water activity ranged from 0.0001 to 0.3 μc/l. The following nuclides were separated: Ce^{141}, Pr^{143}, La^{140}, Ba^{140}, Sr^{89}, Te^{129m}, Te^{129}, I^{132}, I^{131}, Np^{239}, Zr^{95}, Nb^{92m} and Nb^{95}. *Subject Headings:* **1. Radioactivity in precipitation 2. Radioactive fallout composition 3. Bikini H-bomb tests, 1954 4. Yamagata, Japan.**—*G.T.*

9C–162 551.510.721(713)

Terentiuk, F., **Measurement of artificial radioactivity in the atmosphere at Ottawa, Canada.** *Canadian Journal of Physics*, Ottawa, 36(1):136–139, Jan. **1958.** 2 figs., 4 refs. **DWB, DLC**—Daily values of gross β-activity from dust filters are graphically presented for Ottawa for the period May 1956–May 1957, with dates of nuclear explosions (11 exploded by U.S.S.R. and one by U. S.) indicated. Observations of rate of decay, aluminum absorption measurements and efficiency of

the counting system are discussed. *Subject Headings:* **1. Radioactive fallout data 2. Ottawa, Canada.**—*G.T.*

9C–163 551.510.721

United Nations. General Assembly, **First yearly progress report of the Scientific Committee on the Effects of Atomic Radiation to the General Assembly.** *United Nations* [*Document*] A/3365, Nov. 17, **1956.** 11 p. **DLC**—Contains listing by country and title of some four score reports submitted to the Committee by over twenty national governments on progress in research concerning atmospheric propagation of fallout, radioactive precipitation, deposition of fallout, and biological effects. *Subject Headings:* **1. Radioactive fallout bibliographies. I. United Nations Scientific Committee on the Effects of Atomic Radiation.**—*G.T.*

9C–164 662.2:539.1:551.510.721

†U. S. Armed Forces Special Weapons Project, **The effects of nuclear weapons.** Samuel Glasstone, ed. Wash., D. C., U. S. Atomic Energy Commission, June **1957.** 579 p. figs., photos, tables, refs. and bibliogs., glossary p. 544–557. *U. S. Army Pamphlet,* No. 39–3. **DWB, DLC** (UF767.U594 1957)—In **Effects of Atomic Weapons** published in 1950 (*see* 7E–25, May 1956, *MAB*), description of atomic explosions was based on weapons in the 20 kiloton range. In the new handbook blast, shock, thermal, light and nuclear radiation effects are described in terms of weapons up to 20 megatons. Residual radiation and fallout are discussed in Ch. 9 and 10 (p. 390–454). Development of the fallout pattern with time, factors influencing the pattern, rate of fall of particles, distance travelled by particles of different size, composition of the fallout, world-wide fallout, and the behavior of Cesium-137 and Strontium-90 are among the subjects discussed, with data presented in tables, graphs and diagrams. *Subject Headings:* **1. Thermonuclear explosion effects 2. Radioactive fallout. I. Glasstone, Samuel** (*ed.*) **II. U. S. Dept. of Defense III. U. S. Atomic Energy Commission.**—*G.T.*

9C–165 662.2:539.1:612.014

†U. S. Atomic Energy Commission, **Some effects of ionizing radiation on human beings, from the Naval Medical Research Institute, U. S. Naval Radiological Defense Laboratory, and Medical Dept., Brookhaven National Laboratory. A Report on the Marshallese and Americans accidentally exposed to radiation from fallout and a discussion of radiation injury in the human being.** U. S. Atomic Energy Commission, July **1956.** 106 p. figs., tables, bibliog. at end of each ch. **DWB** (612.014 U581s)—This detailed medical report contains data on observations made on individuals exposed to fallout radiation following a nuclear explosion in the Pacific on March 1, 1954. The observations were made immediately following and up to two years after the exposure. The findings are grouped in chapters on clinical observations, skin lesions and epilation, hematologic observations, and internal deposition of radionuclides. The individuals affected will be observed annually for possible long-term effects. *Subject Headings:* **1. Radioactive fallout effects 2. Biological effects of radioactivity. I. Cronkite, E. P.** (*ed.*) **II. Bond, V. P.** (*ed.*) **III. Dunham, C. L.** (*ed.*).—*G.T.*

9C–166 551.510.721

†*U. S. Congress. Joint Committee on Atomic Energy. Special Subcommittee on Radiation, **Hearings before the 85th Congress, First Session, on the Nature of radioactive fallout and its effects on man, May 27–June 7, 1957.** Washington, D. C., Government Printing Office, **1957.** 2 vol. (2065 p.) Charts and figs. (some fold.), tables, eqs. **DWB**—These over two thousand pages of closely printed text (interspersed with tables and figures) undoubtedly constitute the most extensive single source of information (in respect of wealth of material as well as variety of viewpoint and presentation) available at present on radioactive fallout and its effects on human life. As can be seen from the outline for the hearings (which in itself occupies 7 pages, p. 4–10), and from the list of specific questions for discussion (p. 10–13), scientific knowledge connected with the formation, distribution, properties and effects of different types of fallout are analyzed in a most systematic and minute manner. The prepared statements of the 42 witnesses (and statements prepared for the record by experts other than the witnesses) give a complete coverage, each of a particular aspect of the field. Information of great interest is also contained in the transcript of painstaking questioning to which each witness was subjected. Numerous scientific papers, published elsewhere, were also submitted for inclusion and are reprinted in full, with data and illustrations. These reprints in themselves represent a good coverage of progress in radioactive fallout research in the United States. The 12 appendices include extensive bibliographies of international literature (p. 1893–1921 and 1996–2053) and various statements, letters and discussions. The meteorological problems connected with both close-in and delayed fallout occupy a large portion of the report, the U. S. Weather Bureau and other agencies and institutions engaged in meteorological or allied research being well represented among the witnesses. The detailed subject index which is to be published

at a later date can be expected to provide welcome help in the perusal of this monumental collection of fact and interpretation. *Subject Headings:* **1. Congressional hearings on radioactive fallout 2. Radioactive fallout.**—*G.T.*

9C–167 551.510.7:551.577.7(52)

Watanabe, Hironobu; Kosaka, Takao and Ito, Taiichi, **Radioactive rain and contaminated atmosphere observed in Niigata City, Japan.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:283–307. 2 figs., 7 tables.) **DLC** (UF767.J32)—The results of investigations from April 1954–April 1955 on the radioactivity of air, rain, snow, soils, and plants are reported, and the methods of sampling and analysis are described. Precipitation was collected on a vinyl sheet, evaporated in a porcelain dish, and the radioactivity of the residue measured with a Geiger-Müller tube. Data are tabulated and graphed on the radioactivity of rain, snow, and air collected daily, its apparent half-life, the radioactivity of drinking water, 34 types of soil, and plants. *Subject Headings:* **1. Radioactive fallout data 2. Bikini H-bomb tests, 1954 3. Niigata, Japan.**—*SIPRE abstract 15923.*

9C–168 551.510.721:551.577.7:623.454.8

Watanabe, M., **On the artificial radioactive rain water observed at Sendai from April to August 1955.** *Journal of Meteorological Research*, Tokyo, 8(3):130–137, March **1956.** 8 figs., 4 refs., 24 eqs. In Japanese; English summary p. 130. **DWB, DLC**—Since experiments of atom and hydrogen bomb explosions were carried out in the U. S. and U.S.S.R., rain containing radioactive substances has been observed all over Japan. The author of this paper studied the characteristic features of radioactive rainwater using data from April 1 to Aug. 10, 1955. A relation between activity in rainwater and the amount of precipitation is deduced by assuming a model of the floating layer of radioactive dust particles in the air. This relation agrees comparatively well with observation. The decay of radioactivity of rain water is not an exponential function of time but shows a curve consisting of the three processes: (1) $t^{-\alpha}$, (2) exponential and (3) $t^{-\beta}$. (*Same item as* 8.6–356, June 1957, *MAB.*) *Subject Headings:* **1. Radioactivity of rain water 2. Atomic explosion products 3. Sendai, Japan.**—*Author's abstract.*

9C–169 551.510.72:662.2:539.1

Wexler, Harry et al., **Meteorological aspects of atomic radiation.** *Science*, Wash., D. C., 124(3212):105–112, July 20, **1956.** Also issued in: National Academy of Sciences, **The biological effects of atomic radiation.** Wash., D. C., **1956.** p. 45–70. **DLC**—The various mechanisms of propagation of radioactive debris originating in nuclear explosions are discussed. The principal cases analyzed are: (1) Close-in fallout from air bursts and from surface bursts; development of the atomic cloud and distribution of radioactivity within the cloud, and the prediction of close-in fallout. (2) Intermediate fallout and the effects of rain and turbulence upon it. (3) Delayed fallout, transport and diffusion in the stratosphere, mixing through the tropopause and tropospheric removal. Methods used for measuring and forecasting these factors are described and their limitations brought to attention. Among several special problems discussed are stratospheric storage of radiostrontium, contribution of civilian use of nuclear energy to radioactive contamination of the atmosphere, radioactive tracer techniques in atmospheric studies and the possible effect of atomic explosions on weather. (*Same item as* 8.5–126, May 1957, *MAB*) *Subject Headings:* **1. Nuclear explosion effects 2. Radioactive fallout 3. Atomic explosion effects on weather 4. Strontium^{90} stratospheric storage. I. National Academy of Sciences. Committee on Meteorological Aspects of the Effects of Atomic Radiation.**—*G.T.*

9C–170 551.510.71:551.506.7:551.551

Wilkening, Marvin H., **Variation of natural radioactivity in the atmosphere with altitude.** *American Geophysical Union, Transactions*, 37(2):177–180, April **1956.** fig., table, 7 refs., eqs. **DWB, DLC**—The vertical distribution of radon decay products in the lower atmosphere has been measured during airplane flights, using both negative-wire and precipitator methods of sample collection. Data taken by the wire method show a very gradual decrease in activity with height, with considerable activity found to exist at 16,000 ft (msl). The precipitator results indicate an approximately linear decrease with altitude, with no appreciable activity found in samples collected by this method above about 11,000 ft. Measurements made at four ground stations in the altitude interval 4620 to 10,297 ft gave similar results. The mean value for the coefficient of eddy diffusion in the atmosphere calculated from the precipitator data were 7 ± 4 m^2/sec for the plane flights and 11 ± 7 m^2/sec for the ground stations. (*Same item as* 8.3–331, March 1957, *MAB.*) *Subject Headings:* **1. Radioactivity in the atmosphere 2. Airplane observations 3. Eddy diffusion.**—*Author's abstract.*

9C–171 551.510.721:681.14:621.38

Wright, J. H.; Taback, L. and Skramstad, H. K., **A high-speed computer for predicting radioactive fallout.** *U. S. National Bureau of Standards, Journal of Research,* 58(2):101–109, Feb. **1957.** 14 figs. **DLC**—A very high-speed analog computer has been developed for predicting the geographic pattern of radioactive fallout that will occur following a nuclear-weapon explosion. Input data consist of wind magnitudes and directions as functions of initial height in the cloud, and the distribution of radioactivity in the cloud as a function of the particle size (in terms of settling rate) and initial height in the cloud. Output data are presented on a cathode-ray tube, so that the luminance at any point on the screen represents the intensity of fallout accumulated at that point. *Subject Heading:* **1. Radioactive fallout computers**—*G.T.*

9C–172 551.510.721:551.577.7(52)

Yamamoto, Toshio (*Kagoshima*), **Artificial radioactive contamination of rain waters and city waters in Kagoshima, Japan.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:177–180. 3 figs., 2 tables.) **DLC** (UF767.J32)—From simultaneous measurement of artificial radioactivity in rain water, in the city reservoir of Kagoshima, and at a water faucet, the author deduces that a small portion of radioactivity will reach a reservoir through 50 m of soil (volcanic ashes) in one or two days. *Subject Headings:* **1. Radioactivity in rainwater 2. Radioactivity in water supply 3. Bikini H-bomb tests, 1954 4. Kagoshima, Japan.**—*G.T.*

9C–173 551.510.721(52)

Yano, Naoshi and Naruse, Hiroshi, **Artificial radioactive dust—referring radioactive contamination in Nov. 1954.** (In: Japan. Committee for Compilation of Report on Research in the Effects of Radioactivity, **Research in the effects and influences of the nuclear bomb test explosions.** Tokyo, **1956.** Vol. 1:135–140. 4 figs., 2 tables, 5 refs., 4 eqs.) **DLC** (UF767.J32)—Results of radioactivity measurement in dust collected at Tokyo in Nov. 1954 by means of an electric precipitator (instrument and method described) are presented. Measured values are in agreement with those measured in rain water. Probable mechanisms of diffusion of radioactive dust through the atmosphere are discussed. *Subject Headings:* **1. Radioactive fallout analysis 2. Bikini H-bomb tests, 1954 3. Tokyo, Japan.**—*G.T.*

9C–174 551.508.9:551.510.7

Yano, N. and Naruse, H. (*Met. Res. Inst., Tokyo*), **Radioactive dust in the air.** *Papers in Meteorology and Geophysics,* Tokyo, 7(1):34–41, April **1956.** 6 figs., 2 tables, 7 refs., 3 eqs. **DWB**—Various types of dust collectors were tested and the electric dust collector was found suitable for the purpose of radioactivity measurement. Natural radioactivity in the air averages some 10^{-16} C/cm^{-3}, which is mostly due to radon and thoron daughter products. The relation between suction time and saturation with natural radioactivity was studied. Diurnal variation of artificial radioactivity in the air is reported for the period Nov. 1954–March 1956. The maximum activity measured was about 10^{-7} μC/l. *Subject Headings:* **1. Radioactivity measurement techniques 2. Radioactivity in the atmosphere.**—*Authors' abstract.*

ADDITIONAL MATERIAL

9C–175 551.510.721

Anderson, Ernest C.; Schuch, Robert L.; Fisher, William R. and Langham, Wright, **Radioactivity of people and foods.** *Science,* Wash., D. C., 125(3261):1273–1278, June 28, **1957.** 9 figs., 3 tables, refs. Reprinted in Congressional Subcommittee Report (9C–166), p. 752–764, **1957. DLC**—Measurements of the cesium-137 content of people and of foodstuffs indicate that this nuclide is unlikely to be a decisive factor in the long-term hazards from weapons testing and reactor waste disposal. The study of the distribution of cesium-137 is being continued to furnish information on the mechanism of the fallout process and provide a measure of the rate of fallout and of stratospheric storage. *Subject Headings:* **1. Radioactive fallout data 2. United States.**—*From authors' abstract.*

9C–176 551.510.721

Bechert, K. (*Mainz, Germany*), **Theorie der radioaktiven Verseuchung durch Atomwaffenversuche.** [Theory of radioactive contamination by atomic weapons tests.] *Atomkernenergie,* Munich, 3(2):64–68, Feb. **1958.** foot-refs., 26 eqs. **DLC**—Formulas are developed for calculating radioactive contamination of soil and body in the case of continuing atom bomb tests or in the case of a cessation of testing. An application of the formulas to Sr^{90} contamination appears to show that Libby's values of expected soil and body contamination are too low and that Sr^{90} from tests conducted

in the past constitutes a serious hazard for the coming decades, even if nuclear testing is not continued. *Subject Headings:* **1. Strontium^{90} global distribution.**—*G.T.*

9C–177 551.508.9:551.510.7

Becker, F., **Praktische Erfahrungen mit dem Überwachungsgerät des Deutschen Wetterdienstes.** [Practical experience with the monitoring equipment of the Deutscher Wetterdienst.] *Beiträge zur Physik der Atmosphäre*, Frankfurt a.M., 30(2/3):211–214, **1958.** fig., 2 refs. French and English summaries p. 211. **DWB, DLC**—Atmospheric radioactivity is measured continuously at 10 weather stations in Germany by means of air filter apparatus. Some of the increases in the recorded radioactivity curves can clearly be identified as being due to fallout, and they may be compared graphically with meteorological parameters. A sample graph is presented, showing such a comparison of measured radioactivity with various weather elements (synoptic development, rain, etc.). The example shows that large amounts of fission products are brought down not only by rainfall but also by subsidence in regions of marked anticyclones. When such subsidence occurs from subtropical anticyclones, much higher values of radioactivity are recorded than during subsidence from northern anticyclones. This appears to confirm the general belief that the jet stream of middle latitudes is the principal vehicle of radioactive debris propagation. *Subject Headings:* **1. Radioactive fallout propagation 2. Radioactive fallout networks 3. Germany.**—*G.T.*

9C–178 551.510.721

Bell, Carlos G., Jr. (*Northwestern Tech. Inst.*), **Nuclear long-range fallout in surface waters.** *American Society of Civil Engineers. Sanitary Engineering Div., Journal*, 83(SA5), Paper 1400, Oct. **1957.** 22 p. 4 figs., 3 tables, 19 refs. **DLC**—Data are presented graphically on dates of atomic explosions and radioactivity in precipitation, surface water, streams, air and deposits in Massachusetts and New York, for 1951–1953. Areal distribution of fallout radioactivity, decay of radioactivity, selective uptake of fission products in surface waters, the "runoff coefficient" for long range fallout activity, and effect of the Worcester tornado on fallout are discussed. *Subject Headings:* **1. Radioactivity in surface waters 2. Massachusetts 3. New York.**—*G.T.*

9C–179 551.510.721

Butement, W. A. S.; Dwyer, L. J.; Eddy, C. E.; Martin, L. H. and Titterton, E. W., **Radioactive fallout in Australia from Operation "Mosaic".** *Australian Journal of Science*, 20(5):125–135, Dec. **1957.** 7 figs., 5 tables, refs. **DLC**—A meteorological network and a radiological monitoring service were set up for the tests in which two atomic weapons in the kiloton range were fired at the Monte Bello Islands (off the NW coast of Australia) on May 16 and June 19, 1956. The meteorological situation and the fallout observed over Australia are reported in this paper. Daily amounts of radioactivity measured at 29 stations throughout Australia are tabulated for 8 days following each explosion. Results of both gummed paper and air filter samples are included. It is found "that there was no hazard from airborne radioactive material, even in the near vicinity of the test site." Measurements of samples collected from reservoirs, and of radioactive iodine in the thyroids of grazing animals are also reported. *Subject Headings:* **1. Radioactive fallout data 2. Australia.**—*G.T.*

9C–180 551.510.7

Franzen, L. F.; Muszynski, G. and Wiesenack, G., **Natürliche und künstliche Strahlenbelastung.** [Natural and artificial radiation exposure.] *Die Atomwirtschaft*, Düsseldorf, 2(11):362–366, Nov. **1957.** 12 tables, 28 refs. **DLC**—From various sources in German and international literature, data are computed on the amount of natural (cosmic, telluric, etc.) and artificial radiation to which the human body is exposed. Radiation from artificial sources (medical practices, industrial activities, etc.) is found to contribute 20–25% to the total radiation exposure, and only an insignificant amount is due to atomic test explosions. *Subject Heading:* **1. Radiation exposure.**—*G.T.*

9C–181 551.508.9:551.510.7

Hess, Paul, **Radioaktive Überwachung der Atmosphäre.** [Radioactive monitoring of the atmosphere.] *Orion*, 11(3/4):162–165, Feb. **1956.** Illus. **DLC**—The use of weather charts for predicting radioactive fallout distribution, and methods of atmospheric radioactivity measurement are discussed in a popular manner. *Subject Heading:* **1. Radioactive monitoring equipment.**—*G.T.*

9C–182 551.501.9:551.510.7

Hinzpeter, Max, **Grundsätzliches über die Konstruktion der Geräte zur Radioaktivitäts-Überwachung und Einzelheiten des Netzes des Deutschen Wetterdienstes.** [Construction of apparatus for radioactive monitoring and details of the network of the Deutscher Wetterdienst.] *Beiträge zur Physik der Atmosphäre*, Frankfurt a.M., 30(2/3):207–210, **1958.** English and French summaries p. 207. **DWB, DLC**—According to federal law the Deutscher Wetterdienst is charged with the monitoring of the atmosphere with regard to radioactive pollution. The monitoring network com-

prises 10 stations which measure the specific beta activity of the air near the surface and of precipitation. Gamma radiation is recorded when the activity exceeds a certain value. The aerosols carrying artificial activity are deposited on a cellulose filter after the air has gone through a compressor. The activity is recorded by a counter and impulse frequency system. Precipitation activity is measured by a vaporization procedure. To monitor the gamma activity the stations have an ionization chamber which activates a signal at a certain value of discharge by ionizing radiation. Details of the measuring procedures and of the instruments are described. *Subject Headings:* **1. Radioactive monitoring equipment 2. Radioactive fallout networks 3. Germany.**—*Author's abstract.*

9C–183 551.510.71

Israël, H., **Die natürliche Radioaktivität in Boden, Wasser und Luft.** [Natural radioactivity in soil, water and air.] *Beiträge zur Physik der Atmosphäre*, Frankfurt a.M., 30(2/3):177–188, **1958.** 3 figs., 7 tables, 24 refs., 12 eqs. English and French summaries p. 177. **DWB, DLC**—This paper gives a survey of the distribution of the natural radioactive matter in the ground, water and air, with special attention to its circulation from the exhalation from the ground, via its course through the atmosphere back to the ground. From the height distribution of this matter in the atmosphere the amount of alpha, beta and gamma radiation at different heights is computed. Observations of natural radioactivity in and above the oceans suggest that there is a surplus amount of radon in the sea water which makes it probable that there is a radon current in upward direction rising from the bottom of the oceans. Its magnitude can be estimated as being about 0.5×10^{-13} Curie/cm²sec. The radon exchange of the ocean with the air is caused by a "pseudodiffusion coefficient" of the order of 200 cm²/day. *Subject Heading:* **1. Radioactivity in the atmosphere.**—*Author's abstract.*

9C–184 551.510.7

Jecklin, L. (*Basel, Switzerland*), **Radioaktiver Staub in der Luft.** [Radioactive dust in the air.] *Leben und Umwelt*, Basel, 14(1):11–13, Oct. **1957. DLC**—Popular article explaining the properties of various types of natural and artificial radioactivity in the atmosphere. It is reported that the Swiss Commission for Radioactive Monitoring has found radioactivity up to twice the permissible dosage in the initial drops of rainfalls in the Jura Mountains. *Subject Headings:* **1. Radioactivity in the atmosphere 2. Jura Mountains, Switzerland.**—*G.T.*

9C–185 551.510.72

Kellog, W. W., **Atomic cloud height as a function of yield and meteorology.** *U. S. Atomic Energy Commission* [*Report*] *AECU-3403*, June **14, 1956.** 14 p. 3 figs., table, ref. (The RAND Corporation, Contract AT (11-1)-135). **DLC**—The height of burst and yield of a nuclear device have a vital effect on the subsequent fallout, since the size distribution of the radioactive particles is determined by the amount of contact between the initial fireball and the ground. The development of the fireball into a toroidal cloud or smoke ring and its rise are described. It is shown how the atmospheric stability affects the height to which the cloud rises, and the shape which it acquires when it reaches its ceiling. Finally, the dimensions of atomic clouds are presented as functions of yield and typical stability conditions. *Subject Heading:* **1. Atomic cloud height.**—*Author's abstract.*

9C–186 551.510.72:08

Kolloquium über meteorologische Probleme der radioaktiven Luftverseuchung, Darmstadt, March 22–23, 1957, [**Papers**]. Issued in *Beiträge zur Physik der Atmosphäre*, Frankfurt a.M., 30(2/3):119–214, **1958.** figs., tables, refs., eqs. Articles in German, with English and French summaries. **DWB, DLC**—An entire issue of *Beiträge zur Physik der Atmosphäre* is devoted to the papers presented at this **Colloqium on Meteorological Problems of Radioactive Contamination of the Atmosphere.** The over a dozen papers deal with atmospheric diffusion and exchange theory, natural radioactivity, global fallout distribution and instruments and methods for radioactivity sampling and measurement. The pertinent articles are abstracted separately in this bibliography, others will appear in later issues of MAB. (For a complete listing of the authors and titles see p. 372 of this issue). *Subject Heading:* **1. Radioactivity symposia.**—*G.T.*

9C–187 551.510.72:08

Koschmieder, H., **Die meteorologischen Probleme der radioaktiven Luftverseuchung.** [Meteorological problems of radioactive contamination of the atmosphere.] *Beiträge zur Physik der Atmosphäre*, Frankfurt a.M., 30(2/3):119–122, **1958.** fig. **DWB, DLC**—In the fall of 1956 a Special Committee for Radioactivity was organized in Germany for the purpose of studying the problem of radioactive air pollution and submitting a report to the German national assembly at the end of 2 to 2½ years. A colloqium was organized in March 1957 on the meteorological aspects of the problem, in order to give scientists an opportunity to contribute to the research plans. In this paper the chairman of the colloquium (and meteorological expert of the Special Committee) gives an outline of the meteorological factors involved in the propagation of radioactive effluents and

atomic debris, and continuous monitoring of atmospheric radioactivity. *Subject Headings:* **1. Radioactivity symposia 2. Radioactive fallout research 3. Germany.**—*G.T.*

9C–188 551.510.721

Kulp, J. Laurence; Giletti, Bruno J. and Erickson, Glen P., **Isotopic studies on the Greenland continental glacier.** Columbia Univ. Lamont Geological Observatory, Palisades, N. Y., Contract AF 19(604)1891, Final Report, Oct. 31, **1957.** 48 p. figs., tables, refs., eqs. **DWB** (M78.466 K96is)—An expedition to Site 2 on the Greenland Ice Cap and to various other locations in Greenland during the summer of 1956 provided samples for Sr^{90}, tritium, oxygen and hydrogen isotopic assay. The Sr^{90} measurements show the absence of this isotope prior to 1950. From then on the quantity deposited increased each year, essentially doubling each year from 1952 to the present. The total integrated Sr^{90} fallout at Site 2 is estimated to be about one millicurie per sq. mile as compared with 20 mc/mi² in the eastern United States in the summer of 1956.—Comparison of O^{18} data with H/D measurements shows that the O^{18} and deuterium enrichments parallel each other.—The tritium analyses show a considerable range in concentration of this isotope (from <0.3 to 121 in tritium units). The correlation between tritium and Sr^{90} is what might be expected. Roughly comparable variations are found where Sr^{90} occurs. *Subject Headings:* **1. Radioactivity in glaciers 2. Strontium^{90} fallout 3. Greenland Ice Cap.**—*From authors' abstract.*

9C–189 551.510.721

Lapp, Ralph E., **Atoms and people.** New York, Harper and Bros., **1956.** 304 p. **DLC** (QC778.L34)—Radioactive fallout is discussed in Chapter 7, p. 114–139. The March 1954 Bikini H-bomb incident involving the Fukuryu Maru is described. The author also explains how, by using evidence produced by that incident, he was able to derive knowledge revealing the nature of fallout, and thus to contribute to the general pressure which gradually forced the release of fallout information to the public. *Subject Headings:* **1. Atomic explosion effects 2. Radioactive fallout.**—*G.T.*

9C–190 551.510.721

Leĭpunskiĭ, O. I., **O radioaktivnoĭ opasnosti nepreryvnykh ispytaniĭ atomnykh bomb.** [Radioactive hazards from continuous atom bomb tests.] *Atomnaia Energiia*, Moscow, 4(1):63–70, Jan. **1958.** 3 tables, 5 refs., 17 eqs. **DLC**—Radiation levels are calculated for radioactive fallout over the globe, assuming continuous atom bomb testing at the rate of 11 megatons TNT equivalent per year. Strontium-90 concentration in bones, the number of occurrences of leukemia (cancer of the blood) and the number of genetic casualties are computed. It is found that by the end of this century the vertebral Sr-90 concentration may exceed the official maximum permissible dosage in large segments of the population, and every year of continued testing will produce 44,000 cases of genetic diseases and 29,000 cases of leukemia. *Subject Headings:* **1. Radioactive fallout hazards 2. Strontium^{90} global distribution.**—*Trans. of author's abstract.*

9C–191 551.508.77:551.510.7

Leroy, B. and Fresnay, R., **Appareil pour prélèvement d'eau de pluie en vue de l'étude de sa radioactivité.** [Apparatus for collecting rain water for the study of its radioactivity.] *La Météorologie*, Paris, Ser. 4, No. 44:405–407, Oct./Dec. **1956.** 2 figs. **DWB**—A description with the aid of photographs of a device for collecting rain water which is protected from dust in the absence of rain and which closes automatically when a certain quantity of water has accumulated. *Subject Headings:* **1. Rain gages 2. Radioactivity measurement techniques.**—*I.L.D.*

9C–192 551.510.7:551.506.22

Podzimek, J., **Zasedání pracovní skupiny CSAGI pro nukleární záření v Utrechtu 22.-26. I. 1957.** [Meeting of the CSAGI Working Group on Nuclear Radiation at Utrecht, Jan. 22–26, **1957.** *Meteorologické Zprávy*, Prague, 10(4):86, **1957. DWB**—The group gathered under the chairmanship of Prof. Bleeker (Netherlands) for the purpose of working out the program of a world-wide radioactivity survey to be undertaken as part of the International Geophysical Year. Both administrative matters and problems of measurement technique were discussed. According to the recommendations made by the group to CSAGI, radioactivity will be measured in a world-wide network including the Arctic and Antarctic regions. Atmospheric radioactivity will be measured daily by means of the filter method; radioactivity in precipitation will be measured monthly. Measurements will also be made in glaciers and oceans. Several papers were presented at the meeting and are summarized in this account. They dealt mainly with radioactivity sampling and measurement techniques. The authors represented the U. S. (4 authors), Germany (2), Sweden (1) and Japan (1). *Subject Headings:* **1. CSAGI Working Group for Nuclear Radiation 2. Radioactive fallout networks 3. IGY radioactivity program. I. Begemann, F. II. Sittkus, A. III. Machta, L. IV. Revelle, R. V. Schumann, G. VI. Bolin, B. R. VII. Miyake, Y. VIII. Harley, J. H.**—*G.T.*

9C–193 551.510.721:551.511

Rapp, R. R., **A mathematical model of the phenomenon of radioactive fallout.** *U. S. Atomic Energy Commission [Report] AECU-3405*, June 15, **1956.** 14 p. 6 figs. (The RAND Corporation, Contract AT(11-1)-135). **DLC**—The following equation is proposed for calculating fallout distribution

$$x = \int_0^H \frac{V_{x(h)}}{W(r,h)}\, dh,$$

where x is the distance out along some coordinate, r is the radius of particle, H is the height at which it starts, W is the fall velocity and V is the wind velocity. Turbulent diffusion is ignored as it is assumed to have a small effect compared to that of shear and translation. Sample distribution patterns are shown graphically, giving a striking visual impression of the considerable effect of wind on fallout distribution. *Subject Headings:* **1. Radioactive fallout computation 2. Radioactive fallout patterns.**—*G.T.*

9C–194 551.508.9:551.510.72

Schumann, G., **Methodik der Messung künstlicher Radioaktivität in der Atmosphäre.** [Methods of measurement of artificial radioactivity in the atmosphere.] *Beiträge zur Physik der Atmosphäre*, Frankfurt a.M., 30(2/3):189–199, **1958.** 5 figs., 23 refs. English and French summaries p. 189. **DWB, DLC**—Collection efficiency of fiber filters in respect of radioactive particles is discussed. The diagrams presented show 1) suction pressure drops for 5 different types of filters, 2) rate of filter clogging under various atmospheric conditions and 3) decay rates of various types of radioactivity. Data on fission-product radioactivity measured at Heidelberg, Germany from 1953 to the end of 1956 are given. *Subject Headings:* **1. Radioactivity measurement techniques.**—*G.T.*

9C–195 551.510.7:551.506.22

Schumann, G. (*Heidelberg Univ.*), **Radioaktivität der Atmosphäre, der Erde und des Ozeans (Das Internationale Geophysikalische Jahr, XV).** [Radioactivity of the atmosphere, the earth and the ocean (The IGY, Pt. 15).] *Die Umschau*, Frankfurt a.M., 58(5):141–143, March 1, **1958. DLC**—World-wide measurement of radioactivity planned for the International Geophysical Year is discussed. Natural and artificial radioactivity are to be measured in the surface layer of the atmosphere, in the upper air, in ground surface deposits, in oceans and in glaciers. Germany will participate with its existing radioactive dust and precipitation monitoring network. *Subject Headings:* **1. Radioactive fallout networks 2. IGY radioactivity program.**—*G.T.*

9C–196 551.509.52:551.557:551.510.721

Shafer, Charles K. (*Federal Civil Defense Admin., Battle Creek, Mich.*), **Survey of the fallout forecast program in the United States.** *Weatherwise*, Boston, 10(4):111–118, Aug. **1957.** 4 figs., 7 refs. **DWB**—Details of the radioactive fallout program and the methods used by the Federal Civil Defense Administration fallout-wind forecast centers, especially the extrapolation methods when balloons do not reach the required altitudes at any given station, are reviewed. Vectors are prepared for the surface to 80,000 ft and communicated to all centers in the U. S. Examples of integrated flow pattern over the U. S. for 80,000 ft are presented. The U. S. Weather Bureau is responsible for analyzing past data and conducting research in this field. *Subject Headings:* **1. Radioactive fallout computation 2. United States.**—*M.R.*

9C–197 551.510.72:551.557

Sittkus, A., **Beobachtungen an radioaktiven Schwaden von atomtechnischen Versuchen im Hinblick auf atmosphärische Transport- und Austausch-probleme.** [Observations of radioactive clouds from atomic tests with reference to atmospheric transport and exchange problems.] *Beiträge zur Physik der Atmosphäre*, Frankfurt a.M., 30(2/3):200–206, **1958.** 2 figs., 2 tables, 8 refs. French and English summaries p. 200. **DWB, DLC**—The author gives numerical data on travel times of A-bomb fission products. Between Nevada and Southern Germany they amount, in jet stream cases, to less than 5 days. With an hourly suction capacity of 50 m^3 air, under certain circumstances the arrival data may be read directly from the time-activity diagram. *Subject Heading:* **1. Radioactive fallout trajectories.**—*Author's abstract.*

9C–198 551.510.7

Strathmann, Wolfgang (*Cologne, Germany*), **Radioaktivität in Luft, Wasser und Boden.** [Radioactivity in air, water and soil.] *Die Atomwirtschaft*, Düsseldorf, 2(3):85–87, March **1957.** 2 tables, foot-refs. **DLC**—Available knowledge on natural and artificial radioactivity in the atmosphere, and methods of measuring such radioactivity are briefly reviewed. Tables are presented, showing amounts of natural radioactivity from different sources, and artificial radioactivity measured at 21 locations throughout the world. It appears that artificial radioactivity is small compared to the

natural radiation level (about 3% in Germany), and variations of the natural radiation are often considerably higher than the highest long-range amounts from artificial sources. *Subject Headings:* **1. Radioactivity in the atmosphere 2. Radioactive fallout.**—*G.T.*

9C–199 551.510.72:551.509.6

Supino, Paolo, **Il progresso tecnico e l'alterazione dell'ambiente fisico terrestre.** [Technological progress and changes in the earth's physical environment.] *L'Universo*, Florence, 37(2):197–208, March/April **1957.** 3 refs., eqs. **DLC**—Modification of environmental factors by human activities is discussed, with particular attention to increase in atmospheric CO_2 content due to industrial activities, and radioactive contamination by nuclear reactors and weapons tests. The distinguishing feature of atomic industry and warfare, in contrast to other human activities, appears to be the fact that it introduces a new factor into the earth's chemical history, namely the presence of radioactive sources of a magnitude corresponding to dozens of tons of pure radium. It is also calculated that 46 nominal bombs would be sufficient to contaminate an area of 500,000 km² with high-level radiation. *Subject Headings:* **1. Radioactivity in the atmosphere 2. Weather modification.**—*G.T.*

9C–200 662.2:539.1:551.5 551.510.721

Teller, Edward and Latter, Albert L., **Our nuclear future; facts, dangers and opportunities.** New York, Criterion Books, **1958.** 184 p. figs., 13 photos. Price: $3.50. **DLC** (QC778.T4)—In a sequence of 19 chapters the rudiments of nuclear physics, radioactivity associated with nuclear weapons and reactors, and effects of atomic explosions are discussed in a popular manner. Chapter 10 (p. 87–103) takes up problems of radioactive fallout, including the Bikini incident of 1954, the mechanism of atomic debris projection, close-in fallout, stratospheric storage and propagation, etc. In subsequent chapters the subjects of uptake by soil, plants and the human body and biological effects are treated. In a chapter on the cobalt bomb the even greater radioactive menace of such a potential weapon is explained. Possible weather effects are also discussed (p. 146–151) and the single known instance is quoted where an atomic explosion may have been responsible for the production of rainfall (Nevada-California, spring of 1955). *Subject Headings:* **1. Radioactive fallout 2. Atomic explosion effects on weather.**—*G.T.*

9C–201 551.510.721

U. S. Federal Civil Defense Administration, **Probability of fallout debris deposition.** *Its Civil Defense Technical Bulletin*, TB-11-31, June **1957.** 5 p. + 43 charts. diagr., table. **DLC**—On the basis of U. S. Weather Bureau wind soundings covering a 5-year period, average probabilities of fallout distribution around 41 weather stations throughout the U. S. are plotted on a map of the U. S. and detailed regional maps. The percent probabilities were computed from gradient winds at 6 levels from 850 to 150 mb. *Subject Headings:* **1. Radioactive fallout computation 2. United States.**—*G.T.*

9C–202 551.511:551.510.72

Wippermann, F., **Diffusion and Austausch in der freien Atmosphäre.** [Diffusion and exchange in the free atmosphere.] *Beiträge zur Physik der Atmosphäre*, Frankfurt a.M., 30(2/3):143–148, **1958.** fig., 8 refs., 11 eqs. English and French summaries p. 143. **DWB, DLC**—On the basis of LETTAU's theory of diffusion in the upper atmosphere (**Compendium of Meteorology,** 1951) the processes involved in the transfer of radioactive debris are analyzed mathematically and compared as to their relative importance. The processes analyzed are: a) external forces (for instance electric fields), b) pressure diffusion, c) displacement by the mean wind, d) molecular diffusion, and e) turbulent diffusion or exchange. *Subject Headings:* **1. Radioactive fallout propagation 2. Diffusion equations.**—*Author's abstract.*

PART III. REVIEWS, TRANSLATIONS, RECENT MONOGRAPHS, ROUTINE PUBLICATIONS, AND ANALYTICS FROM SERIALS AND COLLECTED WORKS

Note: Material listed in these sections will not be included in the monthly indexes until abstracted. The item number is mentioned for those titles which have been abstracted in previous issues of **Meteorological Abstracts and Bibliography.**

A. REVIEWS OF IMPORTANT METEOROLOGICAL MATERIAL

Assmann, Dietmar: **Die Wetterfühligkeit des Menschen: Ursachen und Pathogenese der biologischen Wetterwirkung** [Weather sensitivity of man: causes and pathogenesis of the biological action of weather]. Jena, Gustav Fischer, 1955. 182 p. Bibliog. p. 160–171. Review by S. Tyczka in *Przegląd Geofizyczny*, Warsaw, 2(3):189–191, 1957. (*For abstract on the original, see* 8K–3, Nov. 1957, *MAB*)

Bruns, Erich: **Handbuch der Wellen der Meere und Ozeane** [Handbook of sea and ocean waves]. 2d ed. Berlin, Deutscher Verlag der Wissenschaften, 1955. 255 p. illus. Review by F. Steinhauser in *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 10(1):117, 1957. (*See* 8.5–26, May 1957, *MAB*)

Chalmers, John Alan: **Atmospheric electricity.** London, Pergamon Press, 1957. 327 p. 65 figs., bibliog. p. 287–288. Review in *Royal Meteorological Society, Quarterly Journal*, 83(358):563, Oct. 1957.

Charlesworth, John Kaye: **The quaternary era with special reference to its glaciation.** London, Edward Arnold, 1957. 2 vol. (1700 p.) 326 figs., tables, bibliogs. (1924 titles). Review in *Science Progress*, London, 45(108):759–760, Oct. 1957. (*See* 9.1–12, Jan. 1958, *MAB*)

Clouds (film strip). Strip A, Convection clouds and ice clouds. Strip B, Layer clouds, wave clouds, billow clouds. With notes by F. H. Ludlam and R. S. Scorer. 1958. Issued by, and available from publishers, Diana Wyllie Ltd., 18 Pont Street, London S.W.1. 24 and 25 slides, respectively. Review by R. E. Lacy in *Weather*, London, 13(2):70, Feb. 1958.

Crowell, Victor L. and Lutz, Alan: **Laboratory manual for earth science survey: astronomy, geology and meteorology.** Minneapolis, Minn., Burgess Pub. Co., 1956. 103 p. Review by Jerome Spar in *American Meteorological Society, Bulletin*, 38(9):559, Nov. 1957.

Dubinskiĭ, G. P.; Gural'nik, I. I. and Mamikonova, S. V.: **Meteorologiia** [Meteorology]. Leningrad, Gidrometeoizdat, 1956. 398 p. 190 figs., map, 30 tables, 17 refs. Review by M. I. Shcherban' in *Meteorologiia i Gidrologiia*, Leningrad, No. 8:65–66, 1957. (*See* 8.9–4, Sept. 1957, *MAB*)

Evans, Frank: **The voyage of the Petula.** London, Robert Hale, 1957. 189 p. figs. Price, sh. 16. Review by Edward Hindle in *Geographical Journal*, London, 73(3):405–406, Sept. 1957.

Germany. Deutscher Wetterdienst: **Klima-Atlas von Rheinland-Pfalz** [Climatic atlas of the Rheinland-Pfalz]. Bad Kissingen, 1957. 37 p. of text. 84 p. of charts (mostly in color). Looseleaf. Review by R. S. Read in *Royal Meteorological Society, Quarterly Journal*, 83(358): 564, Oct. 1957. (*See* 8.8–33, Aug. 1957, *MAB*)

Godske, C. L.; Bergeron, Tor; Bjerknes, Jakob A. V. and Bundgaard, Robert C.: **Dynamic meteorology and weather forecasting.** Pub. jointly by American Meteorological Society and Carnegie Institution of Washington, 1957. 800 p. Numerous figs., tables, eqs. Bibliog. at end of each chapter. Review by J. S. Sawyer in *Royal Meteorological Society, Quarterly Journal*, 83(358): 560, Oct. 1957. (*See* 8.7–5, July 1957, *MAB*)

Grober, J.: **Raumforschung, Bioklimatik und Geomedizin** [Bioclimatic and geomedicine space research]. *Akademie für Raumforschung und Landesplanung, Hannover, Forschung- und Erfahrungs-Berichte*, No. 1, 1956. Issued Bremen. Maps. Price, 2 DM. Review in *Meteorologische Rundschau*, Berlin, 9(9/10):192, Sept./Oct. 1956.

Israel, Dept. of Surveys: **Atlas of Israel.** Pub. jointly by Dept. of Surveys and the Bialik Institute [of the] Jewish Agency, 1956–. Folder 1 and Folder 2 (each 9 maps), both pub. Jerusalem,

1956. Review by Karl Keil in *Meteorologische Rundschau*, Berlin, 10(4):143–144, July/Aug. 1957. (*See* 9.1–36, Jan. 1958, *MAB*)

Ludlam, F. H. and Scorer, R. S.: **Cloud study.** London, John Murray, 1957. 80 p. 74 photos and 7 figs. Review by J. R. Thorpe in *Weather*, London, 13(2):70, Feb. 1958. Review by R. J. Murgatroyd in *Royal Meteorological Society, Quarterly Journal*, 84(359):83, Jan. 1958.

Meteorologia si Gidrologia: Revista Tehnico-Stiintifica [Meteorology and Hydrology: Technical-Scientific Review], **Vol. 1, No. 1, Oct. 1956.** Pub. Bucharest, Editura Hidrometeorologica. Review by Z. Mikuski in *Przegląd Geofizyczny*, 2(3):188–189, 1957.

La Météorologie, Ser. 4, No. 45/46, Jan./June 1957 [A special number dedicated to Alpine meteorology]. 377 p. 200 figs., 10 photos, charts, plates. Review by Raymond Balseinte in *Revue de Géographie Alpine*, Grenoble, 46(1):213–218, 1958.

Monin, A. S.: **Voprosy teorii atmosfernoĭ diffuzii** [Theoretical problems of atmospheric diffusion]. Dissertation summarized by F. A. Kirillov in *Akademiia Nauk SSSR, Izvestiia, Ser. Geofizich.*, No. 7:876–877, July 1956.

B. TRANSLATIONS, RECENT MONOGRAPHS AND ROUTINE PUBLICATIONS

TRANSLATIONS

Borisov, A. A.: **The climate of Southern Finland.** Trans. with editorial changes by G. S. Mitchell from the original Russian in the Journal of the All-Union Geographical Society, USSR (*Vsesoiuznoe Geograficheskoe Obshchestvo SSSR, Zapiski*) New Ser., No. 2:189–198, 1947. Trans. issued Oct. 21, 1948. 12 p. tables. Trans. available as ASTIA, AD-1115.

Briunelli, B. E.: **The possible cause of disturbed daily solar variation of the earth's magnetic field.** (Trans. of the original Russian **O vozmozhnoĭ prichine vozmushchennoĭ solnechnosutochnoĭ variatsii zemnogo magnitnogo polia,** in *Akademiia Nauk SSSR, Doklady*, 99(5):741–743, Dec. 11, 1954. fig., 3 refs., 7 eqs.) Trans. available as ASTIA AD-137-538, issued 1957. 5 p.

Büdel, Julius: **Climatic zones of the Pleistocene.** (Trans. of the original German in *Eiszeitalter und Gegenwart*, 1:16–26, 1951.) Trans. available at Special Libraries Association Translation Center (John Crerar Library, Chicago), as its 57-3212. 10 p.

Cherniavskiĭ, E. I. (sic! A?): **The earth's surface change.** (Trans. of the original Russian in *Akademiia Nauk SSSR, Izvestiia, Ser. Geograf. i Geofiz.*, 12(2):169–176, 1948.) Trans. available from S. L. A., Translation Center, as its R-1839. 17 p.

de Bary, E. and Möller, F.: **Height distribution of clouds in different weather situations.** (Trans. of the original German, **Über die Höhenverteilung der Wolken bei verschiedenen Wetterlagen,** in *Meteorologische Rundschau*, 9(7/8):130–134, July/Aug. 1956. 10 figs., 2 tables, 4 refs.) Trans. by R. S. Quiroz and A. L. Simonds available for reference **DWB** (M76.4 B2960)

Iudalevich, F. F.: **Multiple scattering in the infrared region of the spectrum.** (Trans. of the original Russian, **O mnogokratnom rasseainii v infrakrasnoĭ oblasti spektra,** in *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 7:862–864, July 1956. 3 tables, 4 refs., 4 eqs.) Trans. by E. R. Hope issued by Canada. Defence Research Board, T-239-R, Jan. 1957. 3 p.

Kachurin, L. G.; Zaĭtseva, N. A. and Lomanova, S. I.: **Temperature limits for formation of ice particles in supersaturated water vapor.** (Trans. of original Russian, **O temperaturnykh granitsakh obrazovaniia ledianykh chastits v peresyshchennom vodianom pare,** in *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 7:857–861, July 1956. 2 figs., table, 3 refs.) Trans. by E. R. Hope issued by Canada. Defence Research Board, as its T-237-R, Jan. 1957. 4 p. 2 figs., etc. **DWB.**

RECENT MONOGRAPHS

Chebotarev, A. I.: **Gidrologiia sushi** [Land hydrology]. Ed. by V. I. Uryvaev. Leningrad, Gidrometizdat, 1955. 396 p. Figs., photos, tables, refs., eqs.

Cook Research Laboratories, Skokie, Ill.: **A preliminary evaluation of isometric analysis and forecast representation.** Contract AF 19(604)-1504, Special Report, SPR 87-2, Aug. 15, 1957. 22 p. Figs.

Douglas, R. H.: **Growth of precipitation elements by sublimation and accretion.** McGill Univ. Macdonald Physics Lab., Stormy Weather Research Group, Contract AF 19(604)-2065, Scientific Report MW-26, May 1957. 31 p. Figs., table, refs., eqs.

Drozdov, O. A.: **Osnovy klimatologicheskoĭ obrabotki meteorologicheskikh nabliudeniĭ** [Principles of climatological analysis of meteorological observations]. Leningrad, Izdatel'stov Leningradskogo Universiteta, 1956. 301 p. Tables, figs., eqs.

Hamilton, R. A. and Rollitt, G.: **Climatological tables for the site of the Expedition's base at Britanni SO and the Station on the Inland-ice "Northice."** *Denmark. Kommission for Videnskapelige Undersogelser i Gronland, Meddelelser om Gronland,* 158(2), 1957. 83 p. Figs., tables.

Hardy, William E. and Dickson, Don R.: **Report of minor storms occurring in Oklahoma, Kansas and Missouri in 1956.** Oklahoma. Agri. and Mechanical College. Research Foundation, Contract Cwb 8693, [Unnumbered Report], Dec. 1956. Each section repaged.

Henry, Robert M. and Hess, Seymour L.: **A study of the large-scale spectra of atmospheric kinetic energy, wave speed, momentum flux, and heat flux.** Florida. State Univ. Dept. of Meteorology, Contract Nonr-1600(00), Technical Report, No. 9, March 1, 1957. 30 p. Figs., refs., eqs.

Higbee, Edward: **The American oasis: the land, its uses.** N. Y., Alfred A. Knopf, 1957. 259 p. Photos, refs.

International Geographical Congress, 18th, Rio de Janeiro, Aug. 1956: [**Resume of papers and discussion at the Congress**]. *Revista Geografica* (of the Instituto Pan-Americano de Geografia e Historia), Rio de Janeiro, Vol. 19, No. 45, 1956. 339 p. Resumes usually in language of original paper.

Kalähne, Hermann: **Über die Hydrogeologie der Querfurt-Freyburg-Naumburger Muschelkalkmulde** [Hydrogeology of the Querfurt-Freyburg-Naumburg shell limestone depression]. *Deutsches Gewässerkundliches Jahrbuch, Besondere Mitteilungen,* No. 18, pub. Berlin, Akademie-Verlag, 1957. 41 p. Figs., tables, 195 refs.

Morgen, Alois: **Die Besonnung und ihre Verminderung durch Horizontbegrenzung** [Insolation and its diminution by the limits of the horizon]. *Germany. Deutsche Demokratische Republik. Meteorologischer und Hydrologischer Dienst, Veröffentlichungen,* No. 12, 1957. 16 p. Figs., tables.

Nishioka, Hideo: **Long warm weather cycle ahead: history of cold and warmth.** N. Y., International Economic Research Bureau, 1957. 91 p. Figs., tables.

Ohring, George: **Radiation budget of the stratosphere.** N. Y. Univ. College of Engineering. Dept. of Meteorology and Oceanography, Contract AF 19(604)-1738, Scientific Report, No. 1, June 1957. 42 p. Figs., tables, refs., eqs.

Richards, Marshall M.: **Runoff indices in the rainfall-runoff relation.** Thesis (M.Sc.)—Tennessee Univ., Aug. 1957. 79 p. Figs., tables, refs.

Rouleau, Wilfred T.: **Suppression of condensation trails.** Carnegie Institute of Technology. Dept. of Mechanical Engineering, Contract AF 18(600)-969, Final Report, Pt. 2, Nov. 1956. 60 p. Figs., tables, refs., eqs.

Spencer-Gregory, H. and Rourke, E.: **Hygrometry.** N. Y., Pitman, 1956? 254 p. Figs., tables, refs., eqs.

Tokyo. Univ. Earth Physics School: **Suuchi Hohoo Hoshiki ni Yoru Rai-u Yohoo** [Rainfall forecast by the numerical forecast method]. Tokyo, Daigaku Chikyu Butsurichaku Kyoshitsu, Nov. 1954. 11 p. 7 figs. (In Japanese; legends of figs. superimposed in English)

U. S. Corps of Engineers: **Greenland Ice Cap research program: studies completed in 1954.** Issued 1957. 2 vol. (Collection of reports, each with individual paging) Figs., photos, tables.

U. S. Corps of Engineers. South Pacific Div.: **Development and test performance of radio-isotope-radiotelemetering snow-gage equipment.** Project Cwi-170, [Unnumbered Report], April 1956. 47 p. Figs., tables, eqs.

Voĭtkovskiĭ, K. F.: **Raschet sooruzheniĭ iz l'da i snega** [Design of buildings from ice and snow]. Moscow, Izdat. Akademii Nauk SSSR, 1954. 133 p. Figs., tables, refs., eqs.

Wexler, Raymond: **Advection and the melting layer.** Blue Hill Meteorological Obs., Contract AF 19(604)–950, Meteorological Radar Studies, No. 4, May 31, 1957. 12 p. Figs., refs., eqs.

Wexler, Raymond: **Moisture supply and growth of stratiform precipitation.** Blue Hill Meteorological Obs., Contract AF 19(604)-950, Meteorological Radar Studies, No. 6, June 27, 1957. 19 p. Figs., refs., eqs.

ROUTINE PUBLICATIONS

Coimbra. Universidade. Instituto Geofísico: **Observações Meteorológicas, Magnéticas e Sismológicas, Pt. 2, Observações Meteorológicas** [Meteorological, magnetic and seismological observations, Pt. 2, Meteorological observations], **Vol. 90 and 91, 1951 and 1952,** pub. Coimbra, 1954 and 1955. About 70 p. each. Mostly tables.

Japan. Meteorological Agency, Tokyo: **Annual Report of Agricultural Meteorology, 1956.** Pub. Sept. 1957. 89 p. 30 figs. Almost entirely tables. (*For abstract on 1954 issue, see* 7.3–280, March 1956, *MAB*)

Lomnický Štít, Czechoslovakia. Observatoria: **Ročenka poveternostných pozorovaní** [Yearbook of meteorological observations], **1955.** *Czechoslovakia. Štátní Meteorologický Ústav v Praze,*

Publikacia, Ser. D, Vol. 10, 1955, pub. Prague 1957. 75 p. Almost entirely tables. (*For abstract on 1950, 1951, 1952 and 1954 issues see* 8.6–127, June 1957, *MAB*)

Mauritius. Observatory Dept.: **Annual Report, 1955.** Pub. June 1957. 11 p. fig., 2 tables. Its *Publication* No. 5, 1957.

Spain. Servicio Meteorológico Nacional: **Calendario Meteoro-Fenológico** [Meteorological-phenological calendar], **1957, 1958.** Madrid, 1957, 1958. About 140 p. each. Tables, figs., charts. (*For 1955 and 1956 issues, see* 7.2–83, Feb. 1956, *MAB*)

Spanish Morocco. Servicio Meteorológico: **Boletín Mensual Climatológico** [Monthly Climatological bulletin], **June 1957.** 12 p. (unpaged). Chart, tables. "Prepared by the Meteorological Service of the Division of Tetuan."

Syria. Meteorological Dept. Climatological Section: **Monthly Climatological Data, April 1957.** 36 p. Numerous tables. In English and Arabic.

C. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz., No. 11, Nov. 1957

Sovetskaia geofizika k sorokaletiiu Velikoĭ Oktiabr'skoĭ sotsialisticheskoĭ revoliutsii, [Soviet geophysics on the 40th anniversary of the Great October Socialist Revolution], p. 1313–1322

Velikanov, M. A.: **Raboty sovetskikh geofizikov po problemam gidrologii sushi,** [The works of Soviet geophysicists on the problem of land hydrology], p. 1384–1388

Obukhov, A. M.: **Sovetskie raboty v oblasti izucheniia atmosfernoĭ turbulentnosti,** [Soviet work in the field of atmospheric turbulence research], p. 1389–1392

Mikhnevich, V. V. and Khvostikov, I. A.: **Izuchenie vysokikh sloev atmosfery,** [The study of the upper layers of the atmosphere], p. 1393–1409

Bagariatskiĭ, B. A.: **Raboty sovetskikh uchenykh po svetimosti nochnogo neba i poliarnykh siianiĭ,** [The work of Soviet scientists on the light of the night sky and the polar auroras], p. 1410–1417

Al'pert, Ia. L.: **Kratkiĭ ocherk sovremennykh predstavleniĭ o rasprostranenii radiovoln i ionosfere,** [A short sketch of present ideas on the propagation of radio waves in the ionosphere], p. 1418–1430

No. 12, Dec. 1957

Gamburtsev, G. A.: **O nekotorykh novykh metodakh seĭsmologicheskikh issledovaniĭ,** [Some new methods of seismological investigation], p. 1431–1437

Veĭtsman, P. S.: **Korreliatsiia seĭsmicheskikh voln pri glubinnom seĭsmicheskom zondirovanii zemnoĭ kory,** [Correlation of seismic waves in the deep seismic earth sounding], p. 1438–1452

Savarenskiĭ, E. F.: **O rabotakh po seĭsmologii v Iaponii,** [Work on seismology in Japan], p. 1453–1468

Kalinin, IU. D.: **Organizatsiia seti magnitnykh observatoriĭ v SSSR za 40 let,** [The organization of the network of magnetic observations in the USSR during 40 years], p. 1469–1477

Kononkova, G. E. and Kontoboĭtseva, N. V.: **Kolebaniia temperatury v poverkhnostom sloe moria, vyzvannye volneniem,** [Temperature fluctuations in the surface stratum of the sea produced by swells], p. 1478–1483

Sisigina, T. I.: **Spektral'nyĭ sostav gamma-izlucheniia elementov semeĭstva urana i toriia,** [Spectral composition of the gamma radiation of the elements of the uranium and thorium series], p. 1484–1490

Shifrin, K. S. and Rabinovich, Iu. I.: **Spektral'nye indikatrisy krupnykh kapel' vody i spektral'naia poliarizatsiia radug,** [Spectral indicators of large water drops and the spectral polarization of rainbows], p. 1491–1506

Solov'ev, P. A.: **Zemletriasenie v Tsentral'noĭ Iakutii,** [Earthquake in Central Yakutia], p. 1507–1509

Tamrazian, G. P.: **Razrushitel'nye zemletriaseniia Zakavkaz'ia i fazy Luny,** [Destructive earthquakes of Transcaucasia and phases of the moon], p. 1510–1512

Bulakh, E. G.: **Ob interpretatsii anomaliĭ Δg priamym metodom,** [Interpretation of the Δg anomaly by a direct method], p. 1512–1514

Enenshteĭn, B. S.: **K metodike interpretatsii krivykh elektromagnitnykh zondirovaniĭ,** [Interpretation of electromagnetic sounding curves], p. 1515–1519

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Kirillov, F. A.: **[Resume of] E. V. Piaskovskaia-Fesenkov: Issledovanie rasseianiia sveta v zemnoĭ atmosfere,** [Study of light scattering in the earth's atmosphere: dissertation defended March 23, 1957], p. 1533–1534
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Soderzhanie zhurnala "Izvestiia AN SSSR, Seriia Geofizicheskaia za 1957 g, [Author index of articles in Geophysical Ser. of the Izvestiia of the Akademiia Nauk], p. 1537–1542

American Meteorological Society, Bulletin, Vol. 38, No. 10, Dec. 1957

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Orvig, Svenn: (Review of) **Deutsches Hydrographisches Institut: Atlas Der Eisverhaltnisse Des Nordatlantischen Ozeans und Ubersichtskarten Der Eisverhaltnisse Des Nord- Und Sudpolargebietes,** [Atlas of ice conditions in the North Atlantic Ocean and survey maps of ice conditions of the North and South Polar areas], p. 128–130

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PERIODICALS IN WHICH METEOROLOGICAL ARTICLES REGULARLY APPEAR

★**Acta Geophysica Polonica,** [Warsaw].
Akademiia Nauk SSSR, Izvestiia, Ser. Geogr. and **Ser. Geofiz.,** [Moscow].
American Geophysical Union, Transactions, [Washington].
★**American Meteorological Society, Bulletin,** [Boston].
★**Angewandte Meteorologie,** [Potsdam].
Annales de Géophysique, Centre National de la Recherche Scientifique, [Paris].
★**Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A and Ser. B,** [Vienna].
Australian Journal of Physics, [Melbourne].
★**Australian Meteorological Magazine,** [Melbourne].
★**Ciel et Terre,** Société Belge d'Astronomie, Météorologie et Physique du Globe, [Brussels].
★**Geofisica e Meteorologia,** Società Italiana di Geofisica, [Genoa].
Geofisica Pura e Applicata, Istituto Geofisico Italiano, [Milan].
★**Geophysical Magazine,** Japan Meteorological Agency, [Tokyo].
Hemel en Dampkring, [The Hague].
★**Időjárás,** Magyar Meteorólogiai Társaság and Országos Meteorológiai Intézet, [Budapest].
★**Indian Journal of Meteorology and Geophysics,** [Delhi].
★**Journal of Atmospheric and Terrestrial Physics,** [London].
Journal of Geophysical Research, [Washington].
★**Journal of Meteorological Research,** [Tokyo].
★**Journal of Meteorology,** American Meteorological Society, [Boston].
★**Journal Scientifique de la Météorologie,** Société Météorologique de France, [Paris].
★**The Marine Observer,** Air Ministry, Meteorological Office, London.
★**The Meteorological Magazine,** Air Ministry, Meteorological Office, London.
★**Meteorologické Zprávy** [Prague].
★**Meteorological Society of Japan, Journal,** [Tokyo].
★**La Météorologie,** Société Météorologique de France, [Paris].
★**Meteorologiia i Gidrologiia,** [Leningrad].
★**Meteorologische Rundschau,** [Berlin].
★**Monthly Weather Review,** U. S. Weather Bureau, Washington, D. C.
Polarforschung, Archiv für Polarforschung, [Kiel].
★**Przegląd Meteorologiczny i Hydrologiczny,** [Warsaw].
Revista de Geofísica, Instituto Nacional de Geofísica, [Madrid].
★**Revista Meteorologica,** Junta Nacional de Meteorología, Montevideo.
★**Rivista di Meteorologia Aeronautica,** Servizio Meteorologico, [Rome].
★**Royal Meteorological Society, Quarterly Journal,** [London].
★**South Africa, Weather Bureau, Notos,** [Pretoria].
★**Tellus,** Svenska Geofysiska Föreningen, Stockholm.
Vsesoiuznoe Geograficheskoe Obshchestvo, SSSR, Izvestiia, [Leningrad].
★**Weather,** Royal Meteorological Society, [London].
★**Weatherwise,** American Meteorological Society, [Boston].
★**Wetter und Leben,** Österreichische Gesellschaft für Meteorologie, [Vienna].
★**WMO Bulletin,** World Meteorological Organization, [Geneva].
★**Zeitschrift für Meteorologie,** Meteorologisches Observatorium, Potsdam.

★ Indicates those periodicals which are primarily meteorological.

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